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The Peach and Nectarine.

INTRODUCTION.

We class these two fruits together inasmuch as—culturally, constitutionally, botanically—they may be said to be one. The chief, almost the only differences between them, are those of flavour and finish of epidermis or outer skin. Fond as botanists have been and are of nice distinctions, the presence or absence of woolliness on the rinds of fruit and subtleties of flavouring are rather too uncertain and inconstant foundations on which to erect specific distinctions.

The peach and nectarine are among the most valuable members of the ligneous species of the great natural order *Rosaceæ*, which, with the apple, pear, plum, cherry, apricot, have been erected into the more modern order *Drupaceæ*. The almond differs little from the peach and nectarine, excepting in the thickness of the fleshy envelope that surrounds the stone, and the sweetness, bitterness, or size of its internal kernels. The leaves of the peach and nectarine are also generally somewhat larger than the almond. Both are included in the genera *Amygdalus*, and their generic characters are almost the same, the nut of the almond being generally covered with a dry skin, that of the peach and nectarine with a soft pulp. This distinction does not, however, always hold good, as occasionally part or the whole of individual almonds have their stones inclosed in a fleshy envelope, mostly bitter, but occasionally almost as sweet as inferior varieties of peaches—in fact, the peach-almond seems a sort of intermediate or cross between the peach and the almond, or an almond on the road of evolution into a peach. Still, it makes but little progress, and seems to have halted through all the years.

it has been known to cultivators at about the same half way house, between almond-hood and peach-hood.

All this may prove useful as well as interesting to those readers—daily increasing in number, we trust—who may be disposed to plant the peach and nectarine in their shrubberies and pleasure grounds as ornamental trees. For ornamental purposes they may be held to be almost as hardy and as useful as the almond (*Amygdalus communis*), and its several varieties, among which the double flowering and common dwarf almond are the most useful for planting in groups or single specimens in shrubberies, lawns, home plantations, &c. In warm situations such almonds as the common sweet, soft shelled, sweet pistachio, and others often ripen capital crops of almonds. In such cases the planter has the enjoyment of one of the most charming of all the trees of the spring, and grows his own almonds into the bargain. In specially warm and sheltered places some of the hardier peaches and nectarines may also yield a crop of fruit. But though this may be rare and can occur only in special localities and under specially favourable circumstances, yet the peach—and especially its double and larger flowering varieties—is well worth planting for its flowers alone.

Such early flowering and beautiful trees were not likely to escape the notice of ancient writers. Hence we find the almond-tree named by Moses, and its precocity in flowering seemed to be accepted as a sign of the future devotion of the tribe of Levi for the priesthood. Virgil also accepts the free flowering of the almond as at once proof and omen of a fruitful season. The merry month of May must have been more genial in his day than in these degenerate times, when May makes a ravenous cold snap or collation of myriads of peach and almond blossoms. All before the merry month is cheerful, fair, and beautiful—all behind a blighted, blackened wilderness of barrenness and sterility. Still, it must be said for Virgil that he wrote of standard almond trees, which did not rush into bloom so early as our peaches and nectarines forced back against hot walls, there to be half roasted with the fiery heats of spring sunshine, and frozen through immediately afterwards with the cold darts of May night frosts, without a veil of cloud to tone down the energy of intense radiation.

However, it is hardly fair to merry May to credit her with all our fruit failures, and with blighting the beauty of our standard or dwarf almond and peach trees, for these flower through February and March in warm localities, and also in April. It is this earliness and profusion of blooming that have endeared these plants to man in all ages, and some types and forms of peaches and almonds have probably been cultivated by him for his pleasure and use since the dawn of civilisation. It is, however,

doubtful whether the Persica of some ancient writers is really the modern peach. But there can be no doubt that some species of almond or peach were well known to the Greeks. It is a beautiful legend that links its early flowering to the fervour of a woman's love, and that woman the beautiful Thracian, Queen Phyllis. The story is that Demophoon, son of Theseus, when cast on the coast of Thrace, was hospitably received by Phillis. In return he wooed and won her heart and throne. Recalled to Athens by the death of his father, he promised to return in a month. Detained by cruel fates, which ever mar the course of true love, the lovely queen pined and mourned his absence, until she died broken hearted on the sea shore, over which she had wistfully looked and longed for the return of her husband. Transformed by the pity of the gods into an almond tree, her husband returned in winter, and, learning all that had happened during his absence, rushed to the tree and embraced it with such fervour that the dead Phyllis felt and returned his love by bursting there and then into blossom, though the boughs seemed dead and bare—a sweet legend that may tempt some readers to plant their almonds, peaches, and nectarines in plenty this winter. The Chinese, to whom the peach has been known from time immemorial, connect it with the tree of life—those that ate of the fruit of the peach were to live for ever. Another tradition places the tree on some high mountain guarded by demons. Moore, in one of his sweetest verses, makes the almond tree the emblem of hope:

> **The hope in dreams of a happy hour**
> **That alights on misery's brow,**
> **Springs forth like the silver almond tree,**
> **That blooms on a leafless bough.**

Exactly so. After a long and dreary winter, a time of bare boughs and dead leaves, what more cheering or inspiring than a sudden outburst of beauty from peach, nectarine, or almonds?

Growing these trees mostly for profit, one is apt to lose sight of and underrate their highly ornamental qualities. The profit need be none the less though we first of all feast our eyes and refresh our hearts with delicate colours, perfect forms, and a prodigal profusion of their beautiful flowers, which are second to none among the entire range of flowering trees and shrubs.

In favourable situations on light loamy soils the peach and almond do well as standards, grow rapidly, and reach a stature of from 15ft. to 25ft., and as much as 30ft. high. The habit of the tree is generally somewhat ragged; but this arises largely from the total neglect of training, and also not unfrequently from the overcrowding of other trees. The trees, too, in many localities are rather short lived. This also often arises from neglect. But were it otherwise, they are

not expensive to purchase, speedily grow into beauty, and are therefore readily renewed by planting fresh ones, so that there is little difficulty in filling our shrubberies and home woods with the showy blossoms of these trees early in the season. The leaves are also unique among plants, and their peculiar form and shades of verdure add to the richness and variety of shrub or tree scenery, whether deciduous or evergreen.

The native country of the peach and nectarine, and the date of their introduction to this country, are not generally known. The peach is generally thought to be a native of Persia, and the nectarine is but a variety of the same species, as is proved by their identity of structure in all main points, by the fact that peaches and nectarines are found to grow on the same branch, that fruits have come one half peach and one half nectarine; and that peaches have been raised from nectarine seed, and nectarines from peach kernels. The nectarine, however, has seldom or never been found wild, though the peach abounds in a wild state on the Himalayas at an elevation of about 5000ft. The nectarine is also found rather plentifully in gardens in Northern India. It was supposed to have been introduced into Italy in the reign of the Emperor Claudius, and to have come from Persia. It is probable that the Romans brought the peach and the nectarine with them when they took and held possession of Britain. But if so, these, like many other good gifts of the conquerors, were probably swept away and lost in the wave of barbarism and amid the din of civil and social strife that overflowed England after the retirement of the Imperial power. It is known to have been in cultivation in this country towards the middle of the 16th century, and has long been in general cultivation against walls, under glass, and here and there as a standard tree. It is also in common cultivation as an orchard tree throughout the warmer parts of Europe and the cooler portions of Asia and Africa. It is found plentifully in China and Japan. It is following the footsteps, or rather has been carried by our colonists, into all new countries with a climate suitable for its cultivation; and large peach orchards are found in America, Australia, and New Zealand. Peaches in these countries are grown in orchards in very large quantities, so much so, indeed, as to form food for pigs.

But the chief use of the peach in England, and in most European countries, is that of eating for dessert. For this purpose peaches and nectarines are most highly prized, and justly so. For richness of appearance, lusciousness of flavour, and wholesomeness they stand unrivalled. Green peaches are also used for tarts. For this purpose they should be chosen before the stones harden, in exactly the same state as walnuts are used for pickling, that is, when a knife passes easily through the stones. Some persons are very fond of green peach tarts,

but they should be eaten in moderation, as they are strongly impregnated with prussic acid, one of the deadliest poisons. In this state they also make a unique flavoured jam, and a few of those young fruit or green leaves put into gin or other spirits give them the flavour of noyeau. The ripe fruit are also often preserved in halves, or whole, in boiled syrup for dessert. Peaches and nectarines form a delicious sweet treated thus, and those used for such purposes should not be too ripe. Peaches may likewise be preserved in gin or brandy like Morello cherries; though treated thus they are rather a strong and heady sweet, to be eaten with caution, lest the lusciousness of the peach betray the eater into an excess of spirit. Ripe peaches are also used for pies and compôtes, but the softness and juciness of the flesh are rather against them for such uses, as they need to be rather unripe and to have careful handling. Of course the copious saccharine juice of the peach speedily undergoes fermentation, and peach brandy has long been known as one of its products. Peaches have also fattening properties of no mean order, and although it does seem a degradation of a noble fruit almost to write it, pigs do remarkably well on them. It seems a pity, however, to connect peaches with pork, while the teeming population of our large towns yet hardly know the sight nor flavour of luscious peaches nor nectarines. Attempts have been made to dry the peach and compress it, as plums are, into preserves. Hitherto those attempts have been almost baffled through the excess of juice in the fruit. The same difficulties have prevented peaches from being converted into jellies or jams to any great extent. Attempts have, however, been made, we believe, both in Australia and New Zealand to prepare preserved peaches for export to England. It is hoped that these attempts will ultimately prove successful, so that those who cannot grow their own peaches may yet have the opportunity of eating those grown at our Antipodes or from the large peach orchards of America. The extreme perishability of the fruit at present prevents its distant transport in a natural state. But, preserved in spirits or in sugar, and packed in air-tight tins or jars, there seems no reason why peaches could not travel round the world, and be sold at paying prices to the producer and low rates to the consumer; for few trees are more prolific, and produce crops with greater certainty and at less cost than the peach, where the climate is favourable and where it can be grown as a standard in fields or gardens.

VARIETIES.

THE varieties of the peach are necessarily numerous, inasmuch as the common mode of cultivating peaches in congenial climes is to sow the stones merely, and allow them to bring forth fruit in due season. But these wilding peaches can hardly be considered as within the pale of British cultivation. Peach space here is too valuable; in fact, garden space is too limited and dear everywhere to be furnished by seedlings, for the peach does not reproduce itself true from seeds. Hence when good varieties have been obtained they have been perpetuated by the usual means, budding or grafting, and so little truth is there in the theory of the wearing out of species or varieties for that matter, that it seems probable that some of the peaches cultivated by the Italians when Rome was mistress of the world may still survive among us. Be that as it may, it is certain that within the horticultural historic periods of our own country we have not lost a good variety of peach or nectarine. Until within the present generation we went on growing the old peaches and nectarines of our forefathers, and were perfectly satisfied with them. More marvellous still, most of these old sorts still hold their own as among the finest varieties.

From the fact that both Columella and Pliny caution their readers against the deleterious quality of the peach, it may have been that those early peaches were probably only enlarged or swollen almonds. These are the first European writers who name the peach. Coming to our own country, we find Turner mentioning peaches, red and white, in 1673; perhaps the Noblesse and the Royal George. Coming down half a century later, Parkinson enumerates twenty-one varieties of peach, among which are the great and small white, the yellow, the red russet and carnation, the black, cherry almond, and nutmeg. Clearly we have made little advance in colour since then; he also names the Newington and Roman.

Ray, sixty years later, enumerates sixteen sorts, among which are the red and white nutmeg, the two Newingtons, early and old; the scarlet (royal, and parent to the Royal George) Bloody Monsieur. Miller, over a century since, in 1750, enumerates thirty-one, the whole of which probably exist at the present day. It is almost like reading a modern nursery catalogue to go through Miller's descriptions of the two nutmegs, red and white, both ripening early in July, proving at once that July peaches are not the novelties that many suppose, and that our much-abused climate is not deteriorating so fast and far as has been too hastily assumed. The early Mignon (we adopt

Miller's spelling throughout this list) also ripening in the end of July or early in August; the white Magdalene, the large French Mignon (Grosse Mignonne), Red Magdalene, the early and old Newington, both cling stones, that is, peaches of which the flesh adheres closely to the stones, now justly gone almost out of cultivation, but still largely grown in France under the name of Pavies; the Portugal, the Mountain Pavie; the bloody or mulberry peach, so called from the deep red flush extending quite through to the stone; the Malta, the Chancellor, the Bellegarde (galande), the Lisle or small Violette Hâtive, the Admirable, the Têton de Venus, the Catharine, Royal George, and Noblesse. In Miller's selection from the above of those which he and other authors would prefer to grow 120 years ago, we find the following well known modern sorts: Grosse Mignonne, Chancellor, Bellegarde, Noblesse, Admirable, Royal George, Red Magdalene, and Early Newington.

Loudon, in his "Encyclopædia of Gardening," published more than fifty years ago, extends the list to fifty-three varieties of peaches, consisting of forty-six free stones and seven cling-stone peaches or Pavies. Among the more important of his additions are the Acton, Yellow Admirable, Malta, Early Admirable, and Royal Charlotte. Coming down to modern times, we find the list of varieties, as was to be expected, considerably extended. Dr. Hogg, in his "Fruit Manual," describes about eighty varieties, exclusive of endless synonyms; and Mr. Scott, in his "Orchardist," enumerates, describes, or names about 500 varieties of peaches. Fortunately for cultivators the first named pomologist, in the third edition of his "Fruit Manual," published in 1866, condenses his list of select peaches into the following nineteen sorts, arranged in the order of their ripening: Frogmore Golden (Ingram), Early Grosse Mignonne, Dagmar (Rivers), Dr. Hogg (Rivers), Early Victoria (Rivers), Early York, Early Albert (Rivers), Early Silver (Rivers), Alexandra (Rivers), Grosse Mignonne, Royal George, Noblesse, Bellegarde, Barrington, Walburton Admirable, Gregory's Late, Lord Palmerston (Rivers), Desse Tardive.

This list is not what will be selected here, but it is given to illustrate the importance of making a rigorous selection among so many. This is the more important, as new peaches are still being added, the late venerable Mr. Thos. Rivers, of Sawbridgeworth, having single handed added over thirty fine peaches to our modern lists. He has succeeded in four things with regard to peaches, in improving the constitution of some of our finer strains, such as Noblesse and Royal George; raising earlier, and also later sorts of superior quality, and introducing new characters and flavours by the infusion of fresh blood by the intercrossing of

free stones and cling stones peaches, and nectarines. For example, by furnishing the Alexandra Noblesse with glands and smooth leaves, we have a magnificent Noblesse peach, with a constitution mildew proof. In the Early Louise, Early Beatrice, Early Leopold, Early Silver, Early Rivers, we have early peaches of unusual excellence and variety. Efforts in this direction have also stimulated others, hence the Americans have sent over the Early Alexandra and Early June, both reputed to ripen in June in the open air. In the late peaches, Princess of Wales, Radclyffe, and Lord and Lady Palmerston, are grand additions to late desserts. The nectarine peach again has a smooth skin like a nectarine, almost thus exploding the popular belief that the downy covering is in some mysterious way the cause of the difference of flavour between the two. The Stanwick Early York again has a distinct Stanwick nectarine flavour, and the Early Alfred peach was produced from Hunt's Tawny nectarine, one of the most delicious in cultivation. With such a parentage no one will be surprised to read of this peach that it is most delicious, peculiarly rich and agreeable. We purpose distinguishing Mr. Rivers' peaches with his name in the following lists. With all this peach wealth to choose from it must be obviously a work of much difficulty to compress our list of peaches into the best six, best twelve, best eighteen, and best twenty-four varieties respectively. It would be much easier to name and describe fifty or a hundred varieties from printed lists, than this limited number, from experience of their qualities. But as this would throw the burden of selection on our readers, it will be far better to select a few sterling good sorts for them. In naming so many as even two dozen, it is by no means to be inferred that those that have room for so many peach trees should grow so many sorts. On the contrary, it very often proves at once easier and more profitable to grow three or six trees of one sort than so many varieties.

The following is a descriptive list of the best six Peaches:

Noblesse.—This is still the very best peach in cultivation. The flesh is white, sweet, juicy, melting, luscious, parting freely from the stone. The fruit forms a large pale green or whitish globe, richly marked with red streaks and blotches next the sun. The flowers are large blush colour, the leaves deeply serrated and without glands. In season in the end of August, or in late seasons the first fortnight in September.

Rivers' Alexandra Noblesse was raised from this variety, and is a true Noblesse, with even larger fruit—richer it cannot be than a perfectly ripened Noblesse. The tree is, however, said to be hardier, the leaves smooth, with round glands, and not subject to mildew, which the

Noblesse is apt to be in unfavourable localities. It also ripens earlier, or in the middle of August.

Royal George.—This is also a noble peach, high coloured, downy, pale green, dotted with red on the shady side, as if the intense red on the sunny side which pierces the flesh through to the core broke through in spots on the opposite side of the fruit, which is large and globular. The flowers are small, of a dull red colour, the leaves ample, serrated, and without glands. This variety has no fault, unless it be a weakness for mildew. In localities subject to this troublesome pest it might be advisable to substitute the far too little known and seldom grown George the Fourth for the Royal George. The general features of this fine peach are a good deal like the other, but the leaves have glands, it has a stronger constitution, and is not subject to mildew. The fruit is of great size, of a dark crimson colour on the sunny side. The flesh pale yellow, with red rays passing through to the stone, which is smaller than that of the Royal George. This fine peach ripens early in September, and although the quality is perhaps a trifle coarser than the Royal George, it is melting, rich, and sweet, in all respects a noble fruit.

Grosse Mignonne.—This is a late August or early September peach, with a large round fruit, somewhat depressed at the summit. Skin pale yellow, mottled with red on the shady side, dark red next the sun. Flesh pale yellow, a sure sign of a rich, vinous flavour, which in this case is amply realised, for a more tender, melting, juicy peach it is impossible to find than a well-finished specimen of this popular Grosse Mignonne, with its score or more of aliases. Only, when you order Grosse Mignonnes, and, in fact, any and all of our selections, see that you get them. And the only way to make sure of this is to order only of the best firms, whose characters will guarantee the goods true to name.

Violette Hâtive, Bellegarde, or Galande.—In this case it is almost impossible to avoid giving synonyms, as this same peach is sold under these three or more names. The fruit is large and globular; skin very dark purple next the sun, pale green slightly suffused with yellow on the shady side; flesh pale yellow, melting, rich and juicy; flowers small, reddish pink, leaves crenated with globose glands, habit robust, healthy, free from mildew, and remarkably vigorous.

Barrington.—This is a noble large fruit, deep red next the sun, pale yellowish green on the shaded side. Flesh greenish white, slightly rayed with red to the stone, from which it parts freely, and is rich, juicy, melting, and of high flavour; the flowers are large, of a bright red colour, the leaves crenated with globose glands, the tree is vigorous and seldom attacked with mildew; in season the middle of September.

Early York or Chancellor.—If an early peach is wanted, let it be

Rivers' Early York, a most beautiful early peach, ripening in the open air early in August; but if earliness is not considered of much moment, the sixth peach should be Chancellor, ripening about the middle of September. This is a large roundish oval peach of the highest quality; dark purple, or crimson coloured next the sun, pale greenish yellow in the shade, freely mottled with red at the meeting of the two colours; the flesh is also pale yellow, rayed with red to the stone. The quality is rich, melting, vinous; flowers small red, leaves crenated with glands; habit free, strong, and healthy.

For a list of twelve Peaches add the following six to the above:

Têton de Venus.—Large pale yellowish white, sugary and very rich; in season the end of September.

Raymackers.—A noble peach, a sort of late Noblesse, remarkably rich and melting; end of September.

Lord Palmerston (Rivers).—One of the largest and best of all late peaches; in season end of September and October; flowers very large and beautiful; flesh firm, melting, sweet, requires to be quite ripe or it clings slightly to the stone.

Sulhamstead.—Large, melting, rich and excellent; resembles the Noblesse; pale red next the sun; end of August and beginning of September; a very fine peach.

Crimson Galande.—This is another of Mr. Rivers' valuable seedlings, a free stone peach of the most vigorous habit and the highest quality, ripening in August; deep crimson colour; flesh tender, melting, rich, and delicious.

Dr. Hogg (Rivers).—A large-flowered free-growing variety, ripening in the middle of August; large, firm, melting; stained with red, the flesh rich and sugary.

For a selection of eighteen peaches, to the foregoing add the following six:

Royal Charlotte.—Large, roundish, oval; skin pale white to deep red; rich, juicy, melting, vinous; ripens beginning of September.

Princess of Wales (Rivers).—One of the largest and finest of all late peaches; cream colour, with rich rose next the sun; rich, melting, and delicious; end of September.

A Bec.—This is a remarkably rich early peach, ripening about the middle of August. Flesh white, juicy, tender and melting; colour, pale lemon, dotted with crimson next the sun; glands, round; flower, large. A very useful delicious variety.

Golden Rathripe.—This is the best early yellow-fleshed peach in cultivation, coming in about the middle of August, about the same time as the much-famed American peach, Crawford's Early. It is superior to that

variety, and is very large, melting and rich, of a bright orange and red colour, presenting a rich contrast on the dessert table to most other sorts.

Early Beatrice.—This and Early Louise, Early Leopold, and Early Rivers, is one of the most valuable of all Mr. Rivers' seedlings, coming in in the open air from the middle to the end of July, in favourable localities. The Early Beatrice is a medium sized yellowish peach, almost covered with bright red, has a rich, juicy, melting flesh, and a good flavour.

Stump the World.—A rough, rude name, but a fine, tender, rich, delicious peach, of large size and pale yellow colour, dotted with red.

For a collection of twenty-four of the best peaches add—

Early Grosse Mignonne.—Ripens in August, and in other respects resembles the Grosse Mignonne; one of the finest of all early peaches.

Vanguard.—A robust and hardy variety of Noblesse, and less subject to mildew than that fine variety.

Magdala (Rivers).—This is a fine, almost smooth-skinned peach, raised from Rivers' Orange Nectarine, and it combines the flavour of the peach and nectarine; the colour is a creamy white, marbled with crimson; ripe from middle to end of August.

Lady Palmerston.—This fine peach was raised from a stone of the Pine Apple Nectarine, and partakes, to some extent, of its rich vinous flavour. It is a large handsome peach, of a greenish-yellow colour, marbled with crimson; it ripens towards the end of September, and is a robust grower.

Late Admirable.—This is still one of the best late peaches in cultivation, and is a much surer cropper than the Walburton Admirable, often recommended in preference to it; October.

Salway.—A fine yellow late peach, of excellent quality, ripening as late as the beginning of November, and yet having a rich, juicy, melting flesh and a vinous flavour.

Fortunately there are far fewer nectarines than peaches, and therefore the work of selection is less difficult. Parkinson enumerates six varieties, the Musk, the Roman Red, the Bastard Red, the Yellow, the Green, and the White. To these Ray adds the Murrey, the Tawny, the Russet, the Painted, the Variegated, and the Algiers Nectarine.

Miller enumerates ten varieties — Fairchild's Early, Elruge, Newington, Scarlet Mignon, or Italian, Red Roman, Murrey, Golden, Temple's, and Peterborough. To these Loudon adds the Violette Hâtive, White Flanders, Early Newington, White Genx, Rogers' Seedling, and Claremont.

Dr. Hogg enumerates or describes thirty nectarines, and makes the ollowing selection of a dozen sorts :

Albert, Balgowan, Early Newington, Elruge, Hardwick, Prince of Vales, Rivers' Orange, Homer, Stanwick, Victoria, Violette Hâtive, ivers' White. Mr. Scott, in his "Orchardist," names and describes ixty varieties, and makes the same selection as above.

The following are the best six nectarines :

Violette Hâtive.—Fruit large, roundish, ovate, skin green, yellowish 1 the shade, dark purple, red mottled with brown on the sunny side, flesh ellowish green, deep red against the sun, rich sweet vinous ; one of the nest nectarines, a sure cropper, and a good constitution.

Elruge.—Fine full-sized fruit, pale in the shade, deep red next the un ; flesh pale, rich, and juicy ; habit of tree robust and strong.

Pineapple Nectarine.—This is the richest and most luscious of all the ellow fleshy nectarines, and is better than the Pitmaston orange, or ivers' orange, both fine nectarines of this class. Perhaps this nectarine ught to have been placed first on the list, only that a good many object) the rich piquant flavour of these orange fleshed nectarines, and prefer ıe milder sweetness of the Violette Hâtive and the Elruge. Ripens in eptember.

Downton.—This is one of the largest and finest nectarines grown, s might be expected from its parentage, a cross of Mr. Knight's, be- ween the Elruge and Violette Hâtive. The tree is a vigorous grower, ıe fruit ripens in August ; pale green in the shade, deep red on the nny side, flesh green, red at stone ; highly flavoured, juicy, and ıelting.

Hardwicke.—Fruit very large, almost round, skin pale green thickly)vered with red next the sun ; flesh rich, juicy, and melting ; habit of the ee, excellent ; ripens in the middle of August.

Lord Napier.—This an excellent early nectarine of Mr. Rivers', ıised from the early Albert peach. It has a pale cream colour with a elicate red cheek ; flesh rich and melting ; ripens early in August.

Those who wish to grow twelve choice varieties of nectarines may add ıe following six :

Balgowan.—This large, fine variety may be briefly described as a rger and hardier Violette Hâtive. Greater praise is needless. It is a rge, rich, melting fruit of great merit.

Stanwick Elruge (Rivers).—This partakes most of the character of s latter parent, but has, nevertheless, a dash of the rich, vinous flavour the Stanwick ; and the latter is to nectarines what the greengage is to her plums in superiority of flavour.

Hunt's Tawny.—This is perhaps the richest and best of all the earlier

nectarines. The flesh is deep orange and more piquant than either of the other orange-fleshed nectarines. The tree is also remarkably hardy and prolific. The fruit is medium sized, pale orange in colour, and deep red next the skin. Those who prefer larger nectarines of similar character may substitute Rivers' Orange or Stanwick Orange for this beautiful and delicious variety.

Rivers' New White.—Very pale and delicate and luscious; one of the most delicious and useful of all nectarines when variety of dessert is required; a great improvement on the old white nectarine.

Victoria.—This is another grand seedling of Mr. Rivers, larger and equal to the Stanwick in quality, but without its weakness or tendency to crack, which ruins that variety in so many places. It also ripens earlier, or about the middle or end of September; very large, roundish oval, green, purplish red, melting, rich, sugary, and vinous when quite ripe.

Albert Victor (*Rivers*).—One of the largest nectarines in cultivation, in season through the earlier half of September; colour of fruit green, with a dull red cherry coloured flesh, melting and good.

PROPAGATION.

I.—By Seed.

THERE are three methods of propagating peaches—by seeds, by budding, and by grafting. Seeds are mostly sown for the raising of stocks, the production of new varieties, and as a handy mode of increase where peach trees are grown in quantities in orchards, as in America, Australia, and other countries. No doubt a good many of the seedlings are comparatively worthless. But this is of little moment where peaches are so cheap and plentiful as to be used for feeding bullocks or fattening pigs. The chief point under such circumstances is the production of quantities of trees at the least possible cost. There is no mode of producing peach trees at once so rapid and so cheap as that of sowing them in nursery beds, or dibbing in several seeds at distances of 8ft., 10ft., or 15ft. apart, or such distances as the future peach trees are wished to be. But this is a compressed mode of propagation and planting simul-

taneously wholly unsuited to this country. Here the propagation of peaches from their stones for the production of a peach orchard would be labour lost and land wasted. The chief objects in view by those who propagate peaches from seeds in Great Britain are improved varieties and the manufacture of stocks for furnishing root power for the multiplication of superior varieties. Success in the first can only be reasonably expected when skill and care have been exercised in the selection of the seeds—and even in producing them. No doubt chance seedlings do occasionally spring up possessing extraordinary merit. Of such one success may come to vary the monotony of ten thousand failures. But, by careful selection and skilful cross-breeding, success becomes almost a certainty. Like produces like—only in fruits the succession to primitive or primeval types is so strong as to break the above law of life more often, perhaps, than keep it. Still, the more care in selection and crossing superior varieties the more success. This is abundantly proved by the experience of Mr. Thos. Rivers, of Sawbridgeworth, who has more than doubled the number of good peaches and nectarines. Some of his most successful hits have been made by the inter-crossing of peaches with nectarines and *vice versâ*. By such methods he has succeeded in imparting much of the luscious quality of such nectarines as the Pitmastom Orange and Stanwick to several of his peaches, and in giving more of the size of the peach to such grand nectarines as the Victoria and others. Those who sow seeds for improved varieties can hardly do better than take a leaf out of his book in regard to such matters. By crossing and sowing only the seeds of the finest fruits of the best varieties success becomes well-nigh certain.

As to the time and manner of sowing, Nature affords the best lessons. The fruit falls in the autumn before the leaves, and its pulp and the covering leaves keep the stones moist with a covering of loose friable material through the winter. The pulp especially hastens the decomposition of the hard covering of the seed—the shell or stone—and the covering of leaves retains moisture and excludes frost. By the time the warmth of the spring returns the kernel is in an active state of growth, ready to burst its shell and to begin growth. Hence, upon the whole, the best time to sow peach stones is in the autumn. Choice hybridised seeds should be sown in pans, pots, or boxes, and wintered in a cold pit in a temperature of 40° or so. So treated they will mostly vegetate early in the spring, and may either be potted off or planted out towards the end of May. Or choice seeds may be stored in pits or cellars, in damp sand or earth, in a low temperature, and either planted in the open air in the spring, or in cold or other pits or frames. The growth of such seeds may also be

hastened by storing as above, breaking the stones and removing them, and sowing the kernels only in a gentle heat. Cleared of the hard barrier of the stone, the seeds start at once and make rapid progress, and may, with liberal treatment, be fostered into a nice plant in a few months.

As it is of great moment to be able to prove seedling peaches as soon as possible, this mode of fostering their rapid germination and early growth may become exceedingly useful to the raisers of new and improved varieties. The peach may be fruited the second season from seeds with a little special treatment. It will fruit the third or fourth year without any special hurrying or extra care. Some forward the fruiting of seedlings by selecting the forwardest buds on the top of the shoots of the first season for budding into established trees. These often produce fruiting wood the second season. By grafting the ripest shoots on to suitable stocks in the spring, the fruit buds, if any, of such shoots, may ripen fruit the first year, plentifully the second.

It is said that some peaches come true from seeds in America, or with but little variation. Such has not been found to be generally the case in Europe, though in the latter it must be admitted a new element and cause of variation—that of the stocks—is introduced. It is quite possible that peaches on their own roots would come more true from seeds than those budded or grafted on the plum or the almond. Be that as it may, it is found that there is little constancy in seedling peaches or nectarines in Europe. If there were, the crop of new and superior varieties from seeds would be scantier than it is. It is also extremely doubtful whether, if peaches and nectarines came true from seed, that would prove the best mode of propagating them for garden purposes. On the contrary, experience seems to prove, what could hardly have been anticipated, that the peach thrives better on the plum than on its own roots, or its close ally, the almond.

This fact may well curtail our instructions for the raising of peaches from seeds for stocks, though it may be useful and interesting to some to give such information. The seeds may be sown in rows 2ft. or a yard apart, and 3in. deep; if sown rather thinly they may remain where sown until budded, which may be in the next autumn if the plants have grown well—certainly in the second season. They may be sown in the autumn or spring, as is most convenient, and a light rich soil, on a dry bottom and in a warm situation, are the likeliest conditions to command success. The plants, however, sown in this way, where they are to remain, are apt to run very much into tap root. They grow freely and rapidly, but when removed afterwards often fail to thrive for lack of sufficient fibres. To force the development of these, the peach stones may be sown in beds of rich earth, or in pans or boxes. As soon as

fairly up they may be lined out in rows, at convenient distances, for budding. This early removal of the young plants checks the development of tap roots and causes a more fibry habit, which is of great advantage to the future fertility and well-doing of the tree.

Almonds may be raised from seeds for stocks exactly in the same way as peaches; in fact, an almond may almost be said to be a peach, with little or no pulp outside its stone or kernel. That little is mostly also hard, bitter, and comparatively worthless. But it is obvious that the amount or quality of this external covering can affect the seed or plant produced from it little or none. Hence it is found that almond stocks are as good or better for peaches than the peach itself. They are extensively used for this purpose in France and other warm countries. It is, therefore, probable that the almond might prove a suitable stock for the peach in the more southern counties in England. One great drawback to the use of almonds for stocks is their precocious habit. With such fickle springs as prevail throughout the greater part of the country, any stock that would check rather than foster early growth would prove useful. This is a point that has not yet received the attention it deserves. It is obvious that the stock on which peaches are worked exert a powerful influence on their general health and character. For example, peaches mounted on peach and almond stocks are weaker, narrower leaved, of a paler colour, and shorter lived than those worked on plums. This proves beyond controversy the potency of the stock over the scion. Surely advantage might be taken of this power to force peaches to flower and grow later in the season. But the fact is, the choice of stocks has been almost wholly left in the hands of the sellers of peaches and other fruit trees. Their primary, almost only interest, may often be the getting up of the greatest number of saleable trees in the shortest possible time. But, to return to almonds—it seems all are not equally suitable for peach stocks. The French, who use almonds extensively for peach and nectarine stocks, prefer the hard-shelled sweet almond to all others. Of course, the peach takes freely on the almond, and there is less disparity between the growth of the scion and the stock than between the peach and most plums that are used as stocks for it. The incongruity between these two is made only too obvious by the huge overgrowths of the peach, overlapping the point of union between stock and scion like a huge vegetable wen. These monstrous growths, arising from the inability of the stock to keep pace with the scion, often become the fruitful sources of gum, canker, and most of the other evils that the peach is heir to—or rather, that are forced upon it by the fatal mistakes of cultivators, who are, perhaps, never more at sea than in the choice of stocks on which to work their favourite varieties. Mistakes here, like those in

matrimony, are mistakes for a lifetime. Once the union is effected it cannot be disconnected without destroying the tree, whence the importance of making the best possible match between the scion and the stock. The peach and the almond ought to be the fittest stocks for peaches and nectarines, as far as the laws of consanguinity are concerned. But other things must be studied as well as blood, and prominent among these are soil and climate, and experience seems to prove that the temperature of the earth is too cold for the roots of the peach and nectarine, whence, possibly, the fact that the plum proves the better stock for the peach in this country.

Plums for peach stocks may be raised from seeds or layers; suckers,

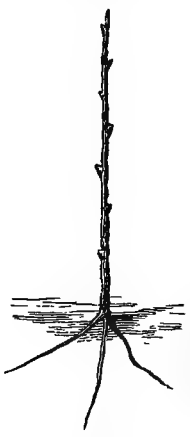

FIG. 1.

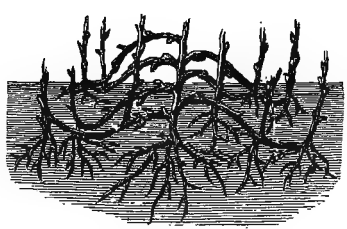

FIG. 3.

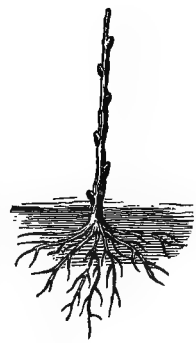

FIG. 2.

which are plentiful at times, may also be used for stocks. The first mode is identical with the raising of stocks from peaches and almonds. The commoner and more free growing plums are generally used for these purposes. These also come more freely from seeds than the finer varieties. The March plum, and what is called the white pear plum, and damsons, are those most generally used. The St. Julien, Black Damask, the Brussels, Magnum Bonum, Orleans, and other plums are also used for stocks. Of late years the Myrobella has also been much employed as a stock for dwarf or small trees. These may be sown in the open ground in the autumn in beds of rich earth, and transplanted into lines as soon as they reach a few inches high. This removal may somewhat check growth for a time, but is needful for the laying the foundation of fertile roots for the peach and nectarine. Fig. 1 furnishes

a good example of sterile, Fig. 2 of fertile roots. The expression may sound singular to many; but the one lesson that recent advancements in horticulture has enforced more emphatically than any other is, that fertility is more a matter of root character than top form or management.

Layers (Fig. 3) have thus an advantage over seedlings; they form a network of fibrous roots, and seldom or ever any tap roots. Of course layering insures the variety wanted. Each rooted shoot must be a facsimile in miniature of the stock. Other modes are often adopted to insure the best roots for the future trees. The stones of plums are sown thickly in beds, or more thinly in rows, and are left to make one or more season's growth, without any attempt to work them. These seedlings are then planted out in lines, 2ft. or 3ft. apart, in November. The plants are cut down to the ground in January or February: they then throw up one or more shoots, the best one being mostly selected, which furnishes good budding wood the same season.

II.—By Grafting and Budding.

Though grafting is not to be recommended generally, it may yet be practised successfully. The older plum stocks, instead of being cut down close to the ground, may in such cases have a few inches of wood left (Fig. 4). The stocks may be cut down in March and grafted with scions selected partly of old and partly of young wood. Whip or a sort of dovetail side grafting is the most suitable. A close fit in every way is of great moment, so that the union may be as perfect as possible. By choosing scions partially of old wood it is a comparatively easy method to get the scions and stocks of almost equal sizes. The wounds should also be as small as possible, so as to reduce the risk of gumming to a minimum. The lower the stocks can be grafted, also, the better, so as to allow of the point of union to be covered over with earth until the union is completed (Fig. 5). It is not well, however, to have any part of union permanently under ground to encourage the peach to root over the stocks, as in the case of pears. Long stocks for tall trees, or riders for the upper parts of walls, may be grafted at any desired height and clayed or pitched over in the usual way (Fig. 7).

Budding is by far the safest and best method of propagating peaches and nectarines. Having provided the stocks, and encouraged them to make a free growth, they will be ready for budding from June to September, according to the time of planting the stocks, mode of treatment, character of soil, local climate, &c. As soon as the bark on the stock runs freely, and the buds of the scions are sufficiently

formed to maintain an independent existence while uniting with the stocks, it is also essential that the bark of the scion should have reached a certain stage of semi-maturity, so as to enable it to separate readily from the wood without bruising or breaking. The latter readily happens with peaches, which have a far more brittle bark than roses. The leaf of the peach should also be cut through in the middle, as, if left whole, the wood has too much purchase on it, and is apt to injure the bud at its base (Fig. 8). Besides, the surface of the entire leaf causes excessive evaporation, and in the bark and in the buds. The smaller the opening in the stock, if it only admits the bud with its sheath of bark, the better. The cross cut at

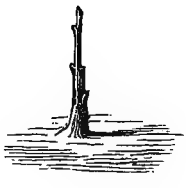

Fig. 4.

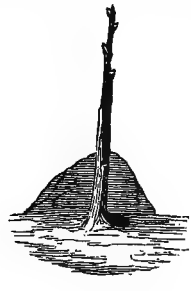

Fig. 5.

the top of the slit should likewise be avoided (Fig. 9). With a little dexterity the bud is easily placed without it, and the fewer and smaller the wounds made the less risk, and the sooner and sounder the union of the bud with the stock. Ties of the very softest bast or of worsted should be used. Everything, in fact, should be scrupulously avoided that would bruise the parts. Even tight tying is a frequent cause of the future failure and break down of the tree. Stone fruits are so subject to gum and canker that anything likely to produce either should be scrupulously shunned. In nine cases out of ten, probably, these diseases are directly produced by careless manipulation in budding or grafting, or subsequent training. Ties are speedily made, and even more speedily forgotten. They are, as a rule, too close at first. As the scions or shoots grow the ties bite into and through the bark. Where nails or shreds are used the case is worse, the risks greater, the injuries more severe and more numerous. Gum or canker follows in the track of wounds, bruises, as surely as night succeeds day. Hence the moment the buds take or unite with the stocks the necessary ties should be first loosened and speedily removed.

The best season to bud will mostly be July; the place for dwarfs within 6in. and 15in. of the ground. But for its being somewhat more difficult, it would often be better to bud peaches and nectarines close to the ground. The peach would thus be simply supported by the roots of the stock, and escape the risks and weakness of the intermediary stem of the stock. This often gets into a diseased and stunted condition, partly through its not keeping pace with the growth of the scion, and also from other causes, such as the leaving of no independent branches, &c. By budding low (see Figs. 8 and 9) all these risks and causes of disease that originate in the stock would be got rid of.

In the case of riders for furnishing the tops of walls, it is common to bud at a height of from 4ft. to 6ft. (See Figs. 10 and 11). The result is

Fig. 7.

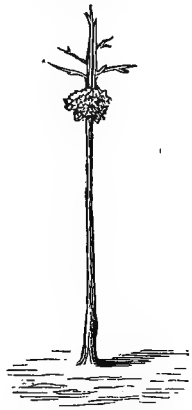

Fig. 6.

Fig. 8.

too often as seen in Fig. 6. These warty excrescences mostly become sources of weakness or the seat of disease. It is easy to avoid these by the simple expedient of budding at the earth's line, as with dwarfs, and leading up the young peach shoot to the height required, as in Fig. 10. The whole tree branches and stems are thus of one uniform quality and character. There is no check to the flow of the sap by contracted sap vessels or channels, consequently no extra deposit of living nor concentration of dead matter in any part of the tree. Neither is there the slightest practical difficulty in reaching the desired height by the peach alone. Most peaches grow vigorously on suitable stocks and in proper soils; and the growth of the future stem of the tree from the bud quickens and sustains the vigorous action of the roots, and, in fact, lays the base of the future health of the tree.

As peaches and nectarines are generally budded in the open, and not seldom start into growth the same season, it is needful to support the young shoots with a stake tied on the stem as soon as they start, to prevent them from being broken or twisted out by the wind. But many of the buds remain dormant. These, as soon as they are

FIG. 9.

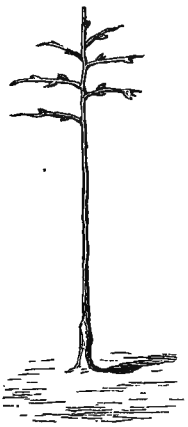

FIG. 10.

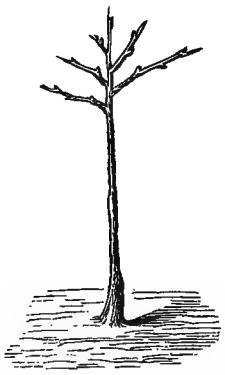

FIG. 11.

properly united, should be wholly untied, so that the bark may get quite healed and hardened before winter. In the case of very late buds, a slight tie might be left on to give them the necessary support, and also a

FIG. 12.

FIG. 13.

small amount of protection. In no case should newly-budded trees—and especially those with dormant buds—be removed till they have made one season's growth.

The best time to cut back the stock to the bud of the scion (Fig. 12) is in the following spring. The top is generally painted or pitched over to prevent bleeding. To be more definite, peaches budded in July and remaining dormant should not be cut back till the succeeding February. Those that start within a month and make shoots during August and

September may be cut back within six weeks of the time of budding. These plants, however, seldom do so well on the whole as those from buds that rest through the winter and gather up their vital force for a bold start the succeeding March. Hence the precocious development of buds should be rather guarded against than encouraged. It has been the usual practice to allow the shoots of peaches and nectarines produced the first year from the bud to grow without checking or stopping the first season. They will often run to a length of a foot or more, breaking out into laterals towards the tops of the shoots (Fig. 11). These shoots have then to be cut back the following winter or spring to within 6in. or so of the base of the shoots. This growth has the advantage of developing the roots to the fullest possible extent. This, however, may readily be overdone, and as the shoot generally has its counterpart under ground, it is extremely doubtful whether long strong roots of this character are not in the end injurious to the trees. It is certain they retard rather than hasten fertility. The few shoots removed also represent a loss of time and force, especially as they were wholly unnecessary, for it is easy to direct growing force to more profitable purposes than the production of food for the pruning knife. By stopping the new shoots of the bud when it has made, say, six fine leaves, as many shoots of medium growth may be produced and matured as there are buds in the axils of the leaves left (Fig. 13). Each of these shoots may also be converted into a fruit-bearing one, and, if not, each will help to form the leaves of a perfect tree at once, and a year sooner than it could be formed by the usual method of cutting the tree back to a few buds and so sacrificing a year's solar, vital, soil, and air force.

In the case of grafts each bud on the scion, or, at least, as many as are wanted to furnish the tree, are preserved and encouraged to grow at once, and this grafting becomes also a means of saving time, and the raising and also fruiting of peaches and nectarines earlier than the usual mode of budding and after treatment. Nevertheless, budding is the best method of propagating all stone fruit, and it depends on the treatment of the buds whether a season's growing force and a year's time are to be sacrificed or not.

TRAINING.

THERE are few things more interesting and even beautiful to the eye of the cultivator than that of a well-formed fully furnished peach or nectarine tree. And such form and furnishing comprises the art of training. That art is at once more easy and more difficult in regard to peaches than

most other trees. The lines of beauty, and such there are in plenty in good training, are less stable and more facile in regard to peaches than, for example, in pears. When once the foundations of form are well and truly laid in regard to the latter, they may last for a lifetime. But the foundations themselves change in reference to peaches. This arises chiefly from the fact that peaches bear their fruit on the wood of the current year. They may be forced to fruit on spurs of a sort, but such unnatural forcing is neither profitable nor desirable in our climate. Hence the importance of adopting such a form of training as will most readily admit of the constant cutting away of the old wood and the laying in of the new.

There is no mode of training that admits of this with such facility as that termed the fan system. Everyone is familiar with a lady's fan when in use, or, better still, a peacock's tail, as the side ribs of the open feathers afford no bad though a crowded illustration of the bearing wood of the peach ranged on either side of its leading shoots in fan training. Fan training not only affords excellent facilities for renewing trees and furnishing wall spaces afresh, but is also capable of many modifications of form, most of them distinguished by more or less merit. The most common mode is the equal or open fan, in which all the branches are equally distributed at as nearly as possible equal distances over the wall, starting from horizontal lines at the bottom, and filling in the semi-spherical spaces with branches at equal distances. The stellate fan can only be applied to riders, as the branches radiate from the bole of the tree in all directions, downwards as well as upwards, at equal angles and equal distances, like the outspread feelers of a starfish.

Seymour's mode of fan training is, without doubt, taking all things into account, the best. The branches may be regulated with as much precision as geometrical lines, and as the central shoot is mostly preserved to develop the side branches where wanted, the framework of the tree is more regularly laid and preserved than in any other form whatever.

Hayward's system differs from this in giving a curve to the branches, and in often having two centres to his trees instead of one. The latter is rather objectionable, as, of course, should either give way, the symmetry and beauty of the tree is ruined.

This last system is a good deal like what is termed the open fan or Montreul training. The trees generally in this case have two horizontal branches, and from these the subordinate boughs diverge in different directions and at certain angles, so as to cover the wall with regularity and despatch. The chief objection to these modes of training, in which the symmetry and usefulness of the trees depend on one or more main limbs, is the liability of peaches to canker in our climate, and, of course, if

one limb goes the beauty and usefulness of the tree is at once destroyed.

Peaches may also be trained horizontally; but the above objections are even stronger against this mode of training than the French and Mr. Hayward's systems, already pointed out. Of late years the cordon system of training peaches has been introduced into England, and is practised to some extent both out of doors and under glass. Though it can hardly be said to take freely among cultivators, nevertheless it has many substantial merits—not the least among them being that, should canker or other diseases attack the trees, the disease or death of one makes but a small blank in a house or on a wall, and is readily replaced. Besides, with a proper system of pinching and pruning, cordon peaches are exceedingly fertile, and the fruit of large size and high quality.

Peaches are also, of course, readily trained into bushes or pyramids in houses or orchard houses. The fancy training of peaches is hardly known

FIG. 14.

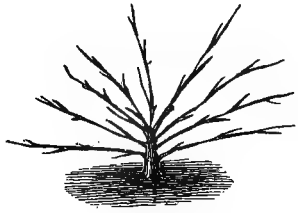

FIG. 16.

FIG. 15.

in England, though it is common in France. The young wood of the peach is pliable almost as the willow, and, of course, skill, time, and patience may train its branches into initials, names, and devices, or fanciful forms of any kind. But these belong rather to the whims and pastimes of cultivators than the serious business of cultivation.

We will now proceed to give a few illustrations and explanations of the different modes of peach training to which we have referred.

The result of heading down (Fig. 12, p. 191) to three or four eyes would be to produce Figs. 14 and 15. During the next summer the number of branches grown would depend very much on the mode of summer treatment adopted. Towards the end of the third or fourth season the equal fan, as it is called, would have advanced into Fig. 16. From this stage the progress to Fig. 17 is merely a matter of time and patience. With a good start the trees bulk into size without losing their true form. It will be observed that the young wood proceeds from any and every point of the leading shoots, either above or below, or wherever

space and a favourable position can be found for it. The chief point in the formation of permanent trees in this form is to cut them back pretty severely at first to insure health and vigour at the base of the

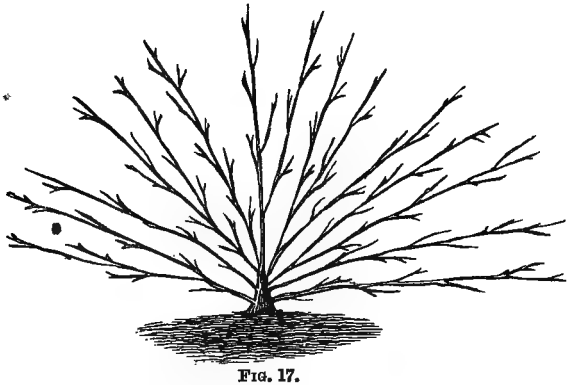

FIG. 17.

tree. As an aid to this, the lower parts of the tree are often elevated considerably beyond the horizontal line in the early stages of growth.

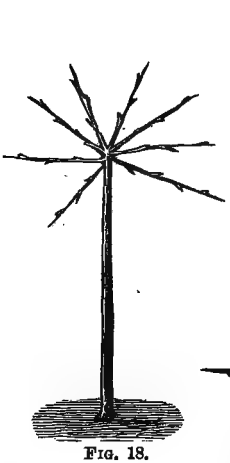

FIG. 18.

FIG. 20.

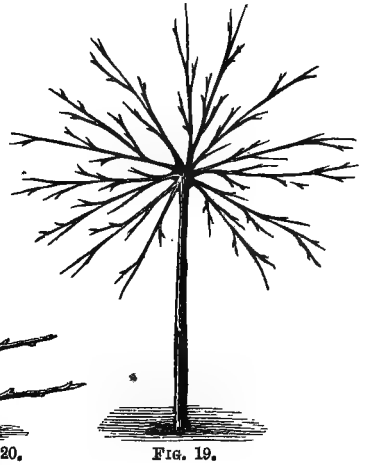

FIG. 19.

This brings the base and the centre of the tree into a nearer approximation to an equality of strength.

The stellate fan (Fig. 18), as it is called, can only be used for rider trees. As it is obvious that to equally distribute the leading branches of a tree downwards as well as upwards, considerable elevation of stem is

essential. This form is very pretty, and often does fairly well. It is, however, often difficult to preserve the strength of the lower branches, which are placed in an unnatural position, and consequently in one of great disadvantage in comparison with the vertical shoots. Practically,

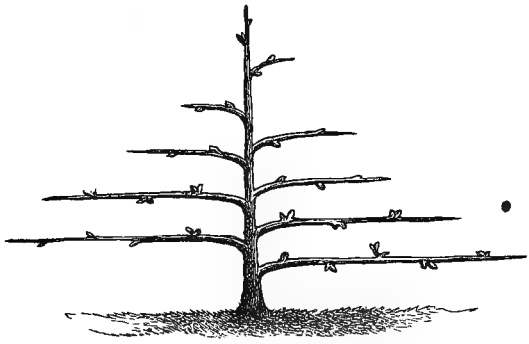

FIG. 21.

too, there is less need for stellate fan training than might at first sight appear, as almost every one furnishes walls from the first with the two

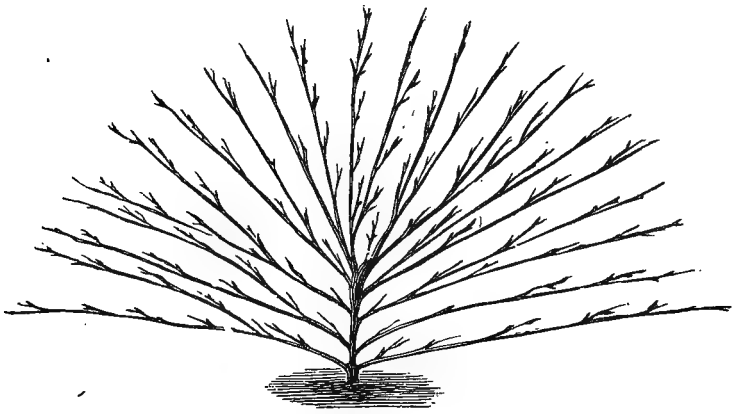

FIG. 22.

classes of trees—riders and dwarfs—the former to clothe the upper portion of the walls, while the latter are clothing the under, and preparing themselves to finally furnish the whole of it. Still, during the initiatory stages there is often a considerable waste of space immediately

around the stems of rider trees; and the stellate fan is a capital form for at once utilising part of this waste, while it is also beautiful in itself. Figs. 18 and 19 show stellate riders half and fully formed, either of which may be employed according to circumstances or the space at command.

Seymour's system of fan training (Figs. 20, 21, and 22) is that most generally adopted. As a rule, two general features distinguish it from the open or common English fan. One is that, generally in Seymour's method, a centre leader is retained in the tree for the furnishing of sub-leaders at regular intervals, and the other that all the fruit-bearing wood is laid in on the upper side of the branches. No doubt the retention of a central leader does much to insure a constant supply of branches. By cutting this centre, which is generally the strongest shoot on the tree, pretty severely back, it cannot fail to produce two, four, six, or even more sub-leaders a season as needed, and at the points required. This last is a matter of much moment, and it cannot always be relied on in the open fan mode of training.

Nevertheless, the central leader can hardly be designated as essential to the adoption to what is, perhaps, the chief merit of Seymour's system. That is, undoubtedly, the placing of all the bearing wood on the upper side of the sub-leaders and other branches. The chief object of this arrangement is to place all the bearing shoots, not only on an equilibrium of advantage, but the whole of them in the best positions. That, it has been assumed, and, perhaps, correctly, is the upper part of the branch. The sap is supposed to flow to each with equal force and volume when so placed. The trees, too, manifest more system, and display greater order trained in this way. Unless, however, considerable care is taken to furnish the upper sides of the leaders with rather more bearing wood than in the ordinary mode of fan training, it is obvious that the trees will really be less fully furnished with wood. This is apparent, and is meant to be made so in the woodcuts. It is often, however, a decided advantage to have less wood, and overcrowding is one of the most patent causes of the decline and fall of peach and other trees. Another objection that has often been urged against Seymour's method is the divergence of the side shoots at right angles to the central stem. The vertical stem, which, of course, ultimately grows into a trunk, is very prone to appropriate the lion's share of the supplies, and the side leaders, especially the lower ones, to be starved into weakness or wholly perish from this diversion of sap to where it is seldom greatly wanted. Fig. 23 furnishes an illustration of a simple means of neutralising the force of this objection very much, if not of removing it altogether, alike in the case of Seymour's and the common open fan training. The lower and other shoots are not only elevated, and kept so

permanently ; but the points of most of the leaders are also more or less depressed or waved. This adds elegance to the trees, and has also certain physiological merits, which probably add to their health, fertility, and stability. A well balanced circulation is the highest

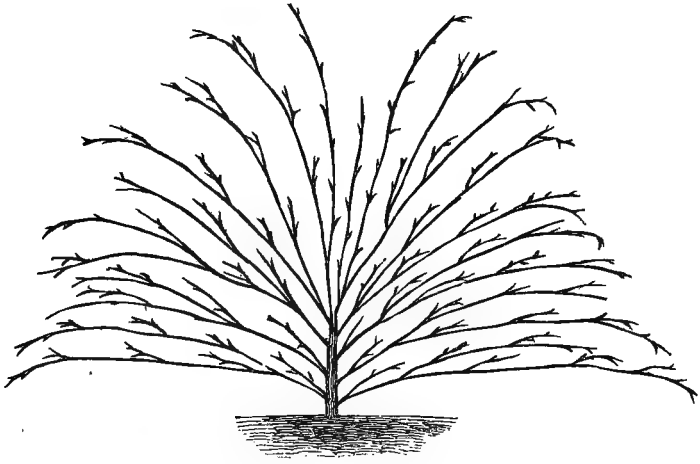

FIG. 23.

security for health in trees as well as men. There can be no doubt these curved lines tend to this result. Each branch has a fairer chance of equal supplies than where a vertical main channel or trunk receives all at first, and becomes the distributor to others afterwards. A semi-pendulous position is also favourable to fertility. This fact may be said to be

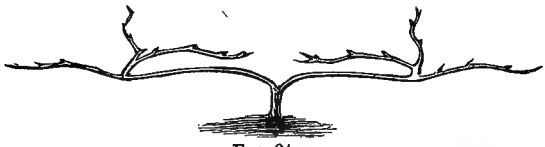

FIG. 24.

established by experience, and is very generally adopted in the weeping conical, or queuonille training of pears or other trees. The dependence of the wood checks at least for a time the flow of the sap, and thus far favours or heightens fertility.

Hayward's curvilinear fan or horizontal training, for it may be either, (Figs. 24, 25, 26, and 27), originated and is advocated on the ground of insuring an equal distribution of sap both in its volume and its force to all

parts of the tree. The mere division of the sap into two channels of equal size and positions, as shown in Figs. 24 and 25, divides the strength of the tree into two equal portions. This equality is still further preserved by

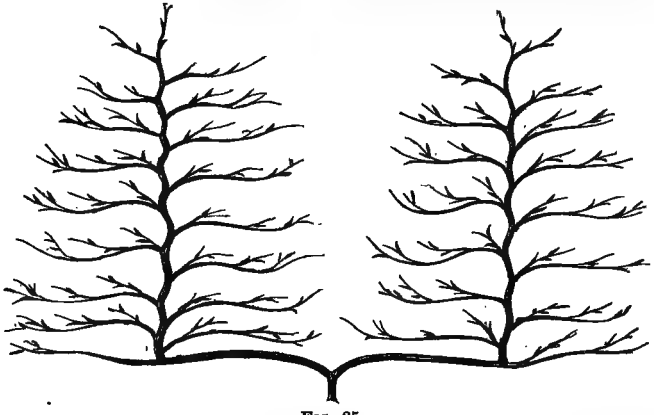

FIG. 25.

placing the leading branches of the tree equi-distant from the root stem or main bole. The waving lines of the main leaders tend to moderate the energy of the upright bound of the sap, while the secondary leaders, as

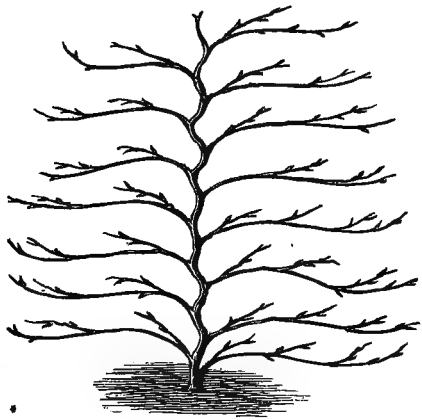

FIG. 26.

will be observed, are placed at such coigns of 'vantage on the crests of the waving lines as to direct the full force of the sap into each. Fig. 24 shows how such trees are started; and Fig. 25 the same tree as it has reached

something like maturity. The weakest feature of such in our climate is the liability of the lower limbs to canker. Something may be done to lessen this tendency by leaving a few bearing shoots on the lower framework of the tree. This would clothe that part with verdure, and also assist in preserving the soundness of the main limbs.

This objection is, however, removed in the case of the single-stemmed

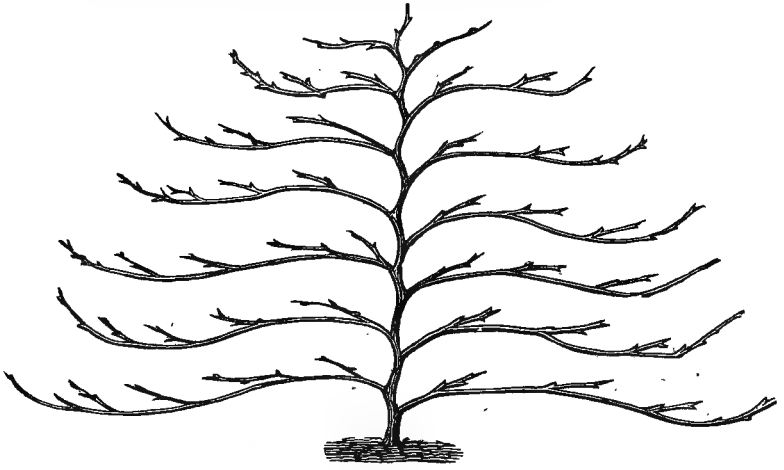

Fig. 27.

wavy-lined tree (Fig. 26)—a very useful form either for peaches or almost any other tree. Fig. 27 is an example of this training of a more decidedly fan form, affording all the advantages of curvilinear leaders, and most of those of the best modes of fan training.

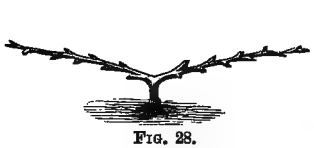

Fig. 28.

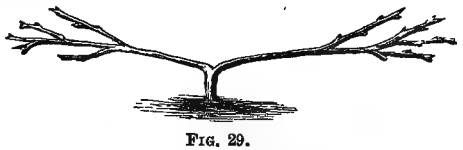

Fig. 29.

We offer yet another method of training peaches, combining most of the merits alike of fan and horizontal training. (Figs. 28, 29, and 30). The tree is formed by cutting the maiden shoots from the buds down to the eyes, and leading two strong shoots of equal strength to the right and left of the stem, as shown in Fig. 28. Fig. 29 shows the same tree in a further advanced state, with its outline defined; and

Fig. 30 the same tree finished. There can be no question that this form has considerable merit. Its weakness for our climate is the liability of peach trees to canker or gum, and so lose one or more of the leading shoots, which is utter ruin to such highly elaborated forms. Under glass, however, and in favourable localities, such trees have a dressy,

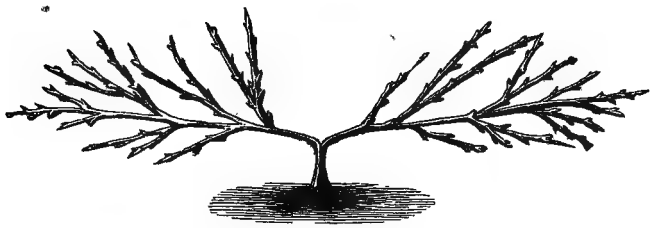

FIG. 30.

finished appearance, and are also well displayed for continuous fertility if carefully managed, so as to keep up a constant supply of young shoots as fruit-bearing wood.

One of the chief merits of the cordon system, of which we offer several illustrations (Figs. 31 to 34 inclusive), is that the trees may be limited

FIG. 31.

FIG. 32.

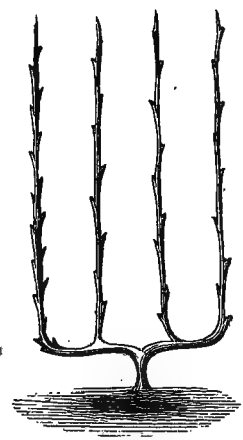

FIG. 33.

to the smallest dimensions, that of a single stem (Fig. 31), or of two, three, or more stems, as in the following figures. It is, consequently, a style of training admirably adapted for ungenial soils and unfavourable situations. In the event, for example, of a cordon peach tree dying, the death creates but a small blank, and may be at once replaced—no

small advantage where land is dear and wall space, as it always is, valuable. The cordon mode of training is likewise admirably adapted for low walls and small gardens.

On low walls the cordons may be trained obliquely over the walls, as in Fig. 34, and the end space filled up with a multiple cordon at the corner, as there shown. On taller walls, again, the cordons may be trained vertically, as in Figs. 31, 32, and 33. These miniature fruit-bearing trees are also most valuable for small gardens. There are thousands of the latter up and down the country in which sufficient space cannot be found for an ordinary sized peach tree, but hardly one garden anywhere in which a good place might not be found for one or several cordons.

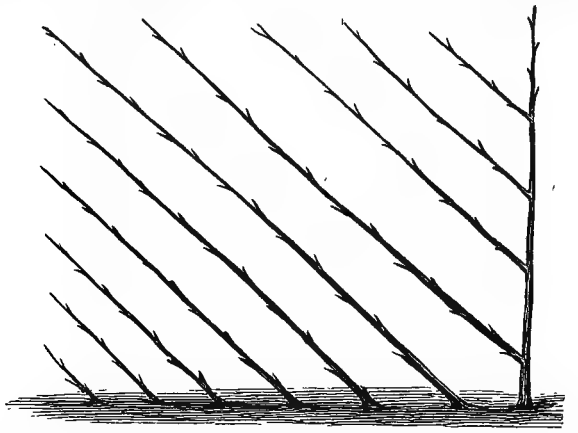

Fig. 34.

Even a single stemmed tree, like Fig. 31, will carry from one to three dozen of peaches. The fruit on cordons are also, as a rule, of full size and rich flavour, and, probably, this regal fruit never looks better than when closely packed on cordons. Another great merit of this mode of training is the facility with which it may be modified to suit or extended to fill special sites or localities. The single stem, so managed as to be in a fruit-bearing state from base to summit being, for example, the unit of cordon training, these units may be added to as easily as figures to a sum in arithmetic (see Figs. 32, 33, and 34, as mere examples of this facility of extension). However, for many purposes and places, the single oblique, vertical, or horizontal cordon—the latter seldom used for peaches, and therefore not illustrated here—are the best. When the cordon is extended, as in Fig. 34, it becomes to all intents and purposes

a tree, distinguished by the merits as well as also the weakness of trees. The multiple three-stemmed cordon (Fig. 34) is large enough for peaches. Some of the best results we have seen have been from single cordons (Fig. 31) and U-shaped cordons (Fig. 32). The shoots of these may be trained from 1ft. to 15in. apart, and they will prove the most prolific and profitable of trees at such distances. Cordon peaches would prove useful in most large gardens; they are, doubtless, the only peach trees possible in myriads of small ones.

While few English cultivators have either the time or the talent to follow their near neighbours across the Channel through the difficult

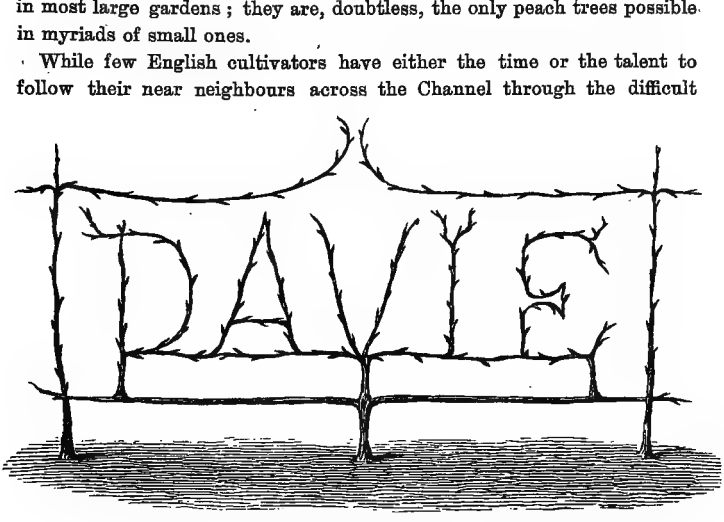

FIG. 35.

mazes of purely ornamental training, perhaps a few readers might be ambitious of displaying their names in illuminated or verdant green characters on their garden walls or residences, and we, therefore, conclude this chapter with Fig. 35, which will afford a hint at least of how at once to achieve such immortality, and at the same time, perhaps, gather a few luscious peaches between the flourishes.

PRUNING.

PRUNING has already been adverted to in as far as pruning is a part of, or associated with, skilful training. But pruning is as essential after the tree is moulded into form, or has reached full size, as before; it concentrates and augments fertility, provides a succession of bearing wood, and

furnishes a quick and ready means of removing all useless, superfluous, or exhausted wood out of the tree. Peach trees left to themselves would quickly sprawl all over the wall, and bear, if at all, only on the extremity of the shoots (Fig. 36). Fig. 37 shows how the place of fertility may be changed by pruning. In virtue of the laws in vegetable physiology, of the strongest rush of sap to the extremities of growth, the outsides of trees would be extended at the expense of their bases and centres. As the peach makes strong annual shoots, varying from a foot to a yard in length, were all these left full length a very few seasons would suffice to ruin the finest trees, for not only would all the best shoots of one year be found on the tip ends of the previous one, but the majority of the buds

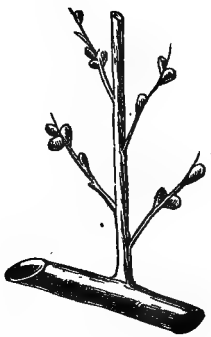

FIG. 36.

FIG. 37.

towards the base of the shoots would either break extremely weak or not at all. The result would be that the bearing wood would be found only on the outer and chiefly also the upper portions of the trees. Hence not only the form of the trees would be ruined, but the quantity of fruit from a given area of wall would be reduced one-half or three-fourths; thus pruning, by keeping up a supply of bearing wood over the whole surface of the tree, concentrates fertility.

But pruning does this in yet other ways. By reducing the number of branches and modifying their character by summer pinching and root pruning, very little but fruit-bearing wood is produced. Leave peaches unpruned, and they produce a perfect forest of shoots, more like a willow copse than a fruit-bearing tree. The result, at the fall of the leaf, is a thin crop of meagre lanky wood buds from base to summit, all incapable

of producing a single fruit bud (Fig. 38). Thus the wood of one year would lay the foundation for a weaker and more worthless crop of wood and leaves only the next, and so on indefinitely. But by reducing the number of shoots by pruning additional strength is diverted into those that are left; and thus by annual prunings the strength of the wood is kept up to a fruit-bearing level (Fig. 39).

What may be called naturally fertile influences have also more free access to and more powerful influence over pruned than unpruned peach trees. It is important in this relation to bear in mind that the peach

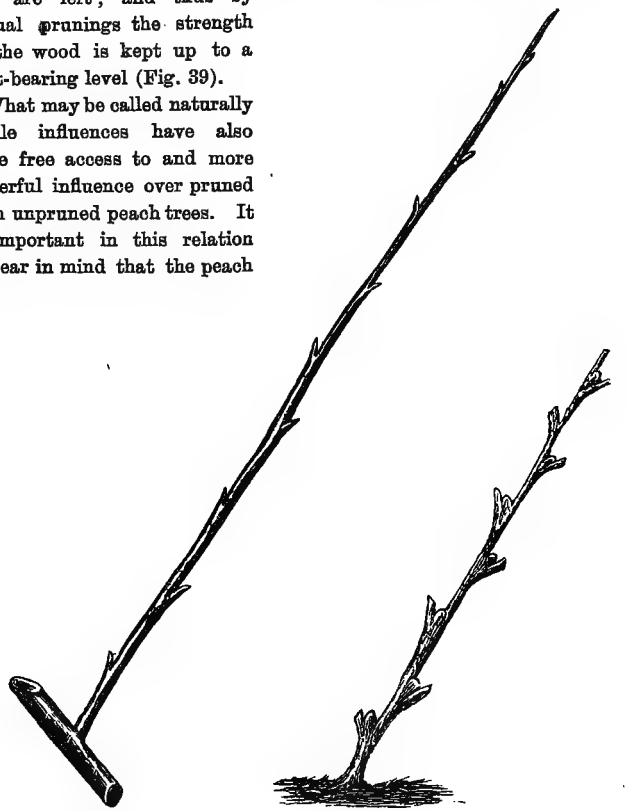

Fig. 38. Fig. 39.

and nectarine are natives of warmer climes than these. Hence the importance of keeping their shoots so thin as to give the light and warmth of the sun and all atmospheric influences free access to every part of each branch. It is for these objects chiefly that such trees are backed up against warm walls instead of planted in the open. But half the advantages that may be derived from warm sites and protecting walls

are lost if the trees are overcrowded with wood. This converts them into a sort of half standards backed against walls, instead of thinly distributed fan or other shaped trees displayed over its surface, and thus fully exposed to solar influences, the originating and sustaining causes of fertility.

There are yet two other methods in which pruning concentrates fer-

Fig. 40.

Fig. 41.

tility. One is to remove unfertile wood, and thus make more space for that which is fertile; and the other, by summer or root pruning, convert what would have been barren wood into fruitful. (See Figs. 40, 41.)

There is a strength of growth that leads to sterility (Fig. 40), though a certain amount of vigour is essential to the production of good crops of peaches and nectarines, and over-luxuriance is by no means the evil nor the danger in peach as in pear growing. Hence root pruning is seldom necessary, and should not be resorted to unless in extreme cases.

The sundering, however, of a few of the thickest roots, and those that are deepest in the ground, say in the October of one year, will reduce the produce of the strongest shoots (Figs. 38 and 40) to the level of fertility (Fig. 41). The strength of these strong shoots may also be broken up by summer stopping or pinching. This divides the strength of one shoot among two or more, and these are of necessity so much weaker and also better.

Suppose, for illustration, a mill race so strong as to overleap the driving wheel; its force may be broken and its point of impact adjusted by simply diminishing or diverting its waters. Root pruning does the

FIG. 42.

FIG. 43.

former, summer pinching the latter, and either method forces the tree to produce fertile shoots.

Another reason for pruning is the maintenance of a supply of fruit-bearing wood all over the tree. Peach trees bear only or chiefly on the previous year's wood. They may be spurred; but the system is so little used that it is scarcely known in England.

The fact, however, that peach wood only fruits once, to put the matter in its broadest light, must of necessity cause much pruning, and calls for much skill in the operation. The peach pruner is compelled not only to prune for the present but for the future. Figs. 42 and 43 give illustrations of this dual purpose of pruning. If Fig. 42 were left full length there would be an excess of fruit, as well as a crop of wood produced where it was worse than useless. In many cases, too, the wood itself

would be bad. The tops of long shoots are often most imperfectly ripened in our climate. This is one natural mode of pruning such trees. Unripened wood becomes an easy prey to the first frosts. These prune or bite back the gross shoots to sounder buds, and so far render an important service to the tree, and ensure finer wood for the next season; but it is seldom the frost carries the beheading far enough, and if it does it does its work in a clumsy manner, and leaves ugly scars behind it, resulting in gums, cankers, gangrene, &c. The clean cut of the knife at once removes all immature wood, and leaves a small wound, which is quickly healed over.

And, besides, the length of the wood may be nicely adjusted to suit the strength of the tree, the demands for bearing wood, the number of fruit wanted on each shoot, and other circumstances. The weaker the trees, the shorter should the bearing shoots be left; the stronger, the longer. The latter statement, however, must be modified by another condition, the necessity of forcing each piece of bearing wood of the one season to produce near its base a succession shoot to fruit the next year. Had Fig. 43, for instance, been left too long, the young shoots shown at its base would have sprung from half-way or more up the shoots, and thus left all the bottom unfurnished the next year.

Fig. 44.

Practically, the young wood may vary in length from 6in. to a foot or more; 9in. would prove a safe average in old trees; for young ones growing vigorously 18in. might not prove excessive. It is, always, however, safer to cut the shoots back too much than to leave them too long, for hard cutting reduces the number of fruit, favours the vigour of the tree, and also ensures a plentiful succession of young wood—the only sure and certain foundation of permanent health and perpetual fertility.

By pruning back Fig. 42, for example, at the disconnecting space shown, the stem pushes a shoot at its base, which is allowed to grow throughout the summer, to succeed the fruit shoot on Fig. 43. At the winter pruning that fruiting shoot is removed at the base, leaving the young shoot which during the summer has formed fruit buds to succeed the one removed. Fig. 44 shows a double supply of succession shoots, one or both of which may be retained after the removal of the last year's fruiting branch. Of

course there are endless diversities of application of the principle of pruning peaches. The foundation is, however, always the same—a good supply of fruit-bearing wood for the current year, and ample provision of younger wood for the next.

Of course this annual renewal of peaches and nectarines involves the annual removal of much exhausted and useless wood. The theory of perfect pruning is a *status quo* of fertility in regard alike to its quantity and quality. This is a difficult matter, and needs much skill even were there no disturbing causes at work to upset it. But there are many such, as, for example, a scarcity or excess of food or water, heat or cold, inequalities and irregularities of growth, insect enemies, the attacks of disease, &c. Several of these adverse influences, that not seldom upset the plans of the most skilful pruners, are under the control of cultivators, and, so far as they are so, should be removed. But who can control the elements or regulate the eccentricities of growth that wreck or foil the plans of the best pruners? The pruner, unless he has visible evidence to the contrary, should treat the tree on the assumption that all its corresponding parts will respond to the knife in very much the same ratio. The word corresponding is used here most advisedly. For instance, the two sides of a tree of equal strength, at an equal angle of divergence from the horizontal or vertical lines, may be expected to break and grow with almost equal force after being cut back in the same ratio. But no experienced pruner would expect two shoots of about equal size cut back to the same extent, the one on the lower horizontal leader and the other on a main vertical shoot, to break with equal vigour or grow with uniform strength. The difference needs to be borne in mind in the removal of useless and exhausted wood. Removed from the centre part of the tree, it is speedily replaced; removed without due thought and care from its lower sides, the tree may remain a shapeless wreck ever after.

The greatest art in this branch of the pruning of peaches and nectarines is so to arrange and foresee matters that a large branch has never to be removed. By annually removing from established trees as much exhausted old wood as there is new to be laid in, the *status quo* of beauty of form, as well as of fertility, is maintained.

Of course, with young trees, until they fill their allotted spaces, considerably more wood is laid in than is removed. With due care in regulating the form or quality of wood made but little pruning may be needed until the trees almost fill their allotted spaces. There is, however, a danger in the express mode of furnishing wall space that the centre and bottom of such trees may be left very bare of fruit-bearing wood. It is often also needful to remove branches of peaches that are

not quite exhausted, as it is necessary to lay in a certain amount of young wood every year. This necessitates the removal of a corresponding amount of older wood. As a rule, when two shoots compete against each other to remain, the older one must go. There are, however, exceptions, as shoots may be young and yet worthless. Weakness and unripeness, as well as disease, may suggest the removal of shoots; and these characteristics are by no means confined to old wood. All weakly shoots, whether old or young, should, if possible, be removed or reduced to the shortest dimensions. Unripe wood finds no quarter from the knife of the skilful pruner; it is the fruitful source of most of the failures that discourage or defeat fruit cultivators. Unripened wood is worse than useless in the tree; it lacks the power of fertility, induces weakness, and invites the attacks of insects. The skilful pruner is therefore quick to mark, and even more quick to remove, all unripe wood as useless and dangerous.

Diseased branches, whether they be old or young, are also cut out at once if they can be spared. The latter caution must, however, be attended to. Occasionally, for example, a main limb on a peach tree may be cankered and continue to yield fruit in that state for years. Under such circumstances it would be a great loss of symmetry as well as of fruit to cut it away. Fortunately, though peach trees are frequently attacked with canker, they seldom suffer from branch or limb dying to anything like the same extent as apricots. These often perish in a few days or weeks. Peaches not seldom linger for years with canker eating slowly into their vital powers and undermining their health. Gum on smaller branches should, however, be cut away at once, the branch being pruned back to beyond the gummed part. Dull wet summers often leave a good deal of mildewed wood on peaches and nectarines. This not only cripples or destroys the leaves, but leaves its deep marks on the young wood. All shoots betraying by their white patches or blotches the presence of mildew must be removed at the winter or spring pruning. At times such wholesale removals may leave the trees bare of wood; but this state is favourable to their renovation and recovery to health and their deliverance from the debilitating influence of this insidious disease.

Fig. 45 furnishes an example of a neglected peach tree, allowed to run away too fast and too far at first. Such trees are often past recovery. But this tree is yet young, and possesses the power of recovery in the buds on its main stem and the adventitious buds hidden near the base of its leading branches. By beheading it, and cutting the latter boldly back, it is therefore possible to force Fig. 45 to renew its youth and make a fresh start in the form of Fig. 46. Similar means are often used to renovate and refurnish with bearing wood particular parts or branches

of choice peach trees. It is, however, much better to prune and train skilfully from the first, when the sacrifice of time and space incident to all plans of regeneration would be avoided.

Perhaps a few words ought to be added on the time to prune peaches in

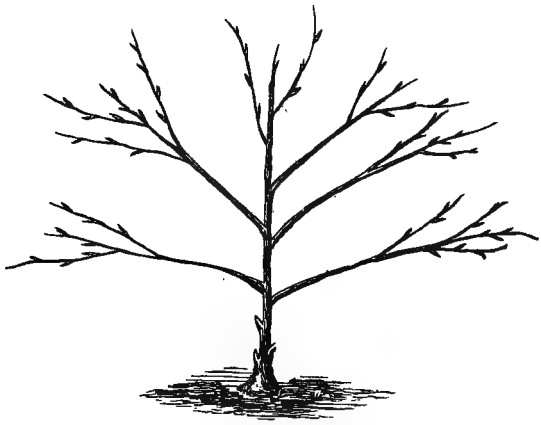

FIG. 45.

the open air. The practice of cultivators has undergone an entire change in regard to this matter within a few years. The pruning is now generally

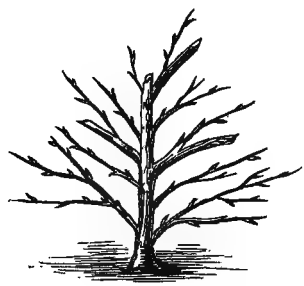

FIG. 46.

left till the trees are almost in bloom, or, say, till February or March. This delay is generally admitted to have a considerable influence in retarding the blooming of peaches and nectarines. Each week or day's delay in the opening of the blossom buds increases the probability of a

crop of fruit. There are also other advantages in late pruning. The winter will generally have revealed all the imperfections or weaknesses of the wood, and, of course, all faulty branches, being thus revealed, would be at once removed. The wounds also seem to heal more kindly and rapidly in the spring, and the bleeding is very slight or *nil*, and seems to do no harm.

Scarcely, however, has the winter pruning been finished when the first step in summer pruning is to be taken. Thus the pruning season of these superior fruits may be said to extend from February to September. This first step in pruning is called disbudding, and a most important one it is. On most shoots of the current year there will be found about three or more times as many wood buds as are wanted to grow into shoots. Some cultivators recommend these, and also a

FIG. 47.

FIG. 48.

large proportion of the flower buds, to be removed at a very early stage, that is, before they are fully developed. The majority of growers, however, prefer a more prudent course. They leave all the fruit buds to open, to see how many will set, and hardly dare touch the young fruit till the end of May or middle of June, for fear that the usual cold snap (about the 20th) makes an end of the embryo fruits; all the wood buds are also left for a time. Three good reasons may be assigned for thus deferring disbudding. The wood shoots posted near to the fruit buds afford them some slight protection; the development of all the buds stimulates the action of the roots, often very slow and sluggish, in their important work of collecting and conveying food in the early spring; and the starting of all the buds gives the cultivator the power of selecting not only the best placed but strongest and most perfectly developed buds. Fig. 47 shows a peach shoot with all its buds intact; Fig. 48 the same shoot after disbudding. To render the process more clear, the number of buds in this example is small, and no fruit buds or embryo fruit are shown. In this case,

too, one bud is left on the lower side of the shoot (Fig. 48). This would be removed at a later stage, as a leading shoot and another proceeding from the base of the shoot (Fig. 47) would be quite as many as there were room for. The process of disbudding should also be tentative. A few a day from each shoot is far preferable to the removal of all at once. There is no better mode of disbudding than the rubbing or picking them off with finger and thumb. The later ones, however, that may have partially developed into shoots, may be removed with a sharp knife. Cordon peaches (Figs. 40 and 41) should not be disbudded like other trees. The object with these is to remove as many buds or

FIG. 49.

centres of fertility as possible; consequently, each bud may be allowed to break into a shoot and form at least two or more leaves; these short branches to be cut closely back at the winter pruning, as shown in Fig. 41. This system of close stopping when persisted in forces the peach to form spurs; and from these or the base of the incipient shoots there is seldom any difficulty in furnishing sufficient fruit buds to produce a plentiful crop. A common arrangement of peach buds is one fruit bud supported by two wood ones or fruit buds in clusters of three or more, and in cordon peaches two wood buds are not unfrequently allowed to remain, and be pinched back one on each side of the fruit instead of one bud only, as shown in Fig. 40. Figs. 49, 50, and 51 illustrate the process of summer stopping and some of the more obvious results. Fig. 49 shows

the first stopping or pinching. This may be done for a variety of reasons, such as to plump up the base buds of the stopped shoot, or to make it break into other shoots, as in Figs. 50 and 51. It is also often done when the shoot reaches up towards another in the same direction, so as to prevent the head of one shoot from overshadowing the base or principal fruiting part ahead of it.

With trees in robust health, in rich soil, and during what is called growing weather, the buds on the extremities of Fig. 49 frequently break again almost at once, as shown in Fig. 50. In such cases the base buds are not sufficiently filled, and a second pinching may be needed, as shown in Fig. 50. It is seldom that more than two pinchings are desirable for peaches in the open air in our climate.

Cases, however, not seldom occur when, by the loss of considerable

Fig. 50.

Fig. 51.

branches or secondary leading shoots, large blanks occur in peach and nectarine trees. There are no surer nor quicker methods of filling up these than by the early stopping or pinching back of strong shoots, and then forcing them to break into three or four shoots, as in Fig. 51. These shoots are not stopped again, and by the end of the season furnish a welcome supply of well ripened wood to make good accidental breaches in the trees. Summer pinching may thus save a season and promptly restore the health or symmetry of trees crippled by disease or disfigured by accident. To insure these results it is, however, needful that the pinching back should be done early, say, towards the end of May or early in June. If too late, the result will be a crop of unripened green wood, about the surest possible legacy of weakness and disease to trees of any sort, and peaches and nectarines in particular.

After July the summer pruning consists chiefly in the removal of late shoots that spring forth from the current year's wood and the stopping

of the tops of growing shoots when their heads overlap or overcrowd others of more importance. From that period to the end of the year the pruner should aim at the ripening of the wood already made rather than the production of more. The removal of lateral branches will aid the maturation of the shoots left. At times, however, this is not enough, as it is often possible to reduce the number of branches with the best results in July. In cases even where the fruit may have failed on some of the main leaders these may be boldly cut out, thus leaving more space for the young wood. Wounds made in summer also heal much sooner on trees so subject to gum as peaches and nectarines, than such wounds made in winter or the early spring. As the young wood reveals its true character it is often possible to elect the fittest or best about this season, and by the removal of all superfluous shoots and sprays, latent force is diverted and concentrated into the branches left; and besides, these are exposed to more light, heat, air, and moisture, and consequently are enlarged in size and better matured.

To all these modes of pruning some would add yet another, that of leaf thinning and mutilation. But with a wise selection and a free reduction in the amount of wood, neither of these processes should be adopted. Many, however, remove part of the leaves during September or October, those that come off easiest and overhang the shoots the most being chosen for removal. Others, again, cut numbers of the leaves across the middle with a sharp knife or scissors. It is not, however, needful to refer further to these modes of leaf thinning or pruning, as they belong rather to the crude barbarism of a past age than to the science and practice of modern pruning.

PLANTING.

CONSIDERING the commercial value and universal appreciation of these fruits, it is surprising that they are not more generally and extensively cultivated, especially in small gardens. True they need the protection of walls to bring them to perfection in our climate. The few instances of standard peaches ripening fruit in the open air are but the exceptions that confirm the rule. The wall space of dwelling houses alone suitable for peach culture might be measured by hundreds of square acres. And then there are farm buildings, warehouses, factories, workshops, maltings, railway stations, dead walls, and fences innumerable mostly unclothed and unfurnished with any sort of trees. A large

proportion of such furnish excellent aspects and positions for the cultivation of peaches and nectarines.

It is a singular fact that where there is least ground or wall there is not seldom to be found the most prodigal waste of both. As a rule every inch of large gardens is utilised. The same can hardly be said of small gardens in general. A majority of the possessors of small gardens seem to take it for granted that they cannot grow peaches. This is quite a mistake. "Where there's a will there's a way," and the amateur who determines to try peach growing will seldom be baffled for lack of a suitable place for the purpose. Maiden trees are also cheap and plentiful; and the object of this manual is to render the details of culture simple and easy. The chief points in regard to the planting of peaches will be included under time, site, soil, and method of planting.

I.—Time.

THE best time for planting peach trees is the month of November. That, in fact, is by far the most suitable time for the planting of all deciduous trees and shrubs. The air, the earth, the plant, then seem in the best possible condition for the formation of new roots, and the rapid multiplication of old ones. The air is generally moist, the earth moderately warm, and the plant in an unusual state of root forming excitement in November. Open, moist, mild weather should be chosen for the purpose. Frost and cold dry winds are almost death to roots. It is wholly unnatural to expose them to the air, and hence their suffering in consequence. Even the hardiest trees will not bear frost on their roots, and, as a matter of fact, no trees in a state of nature can have their roots much or at all frozen. Nature never transplants her trees, consequently cannot expose the roots to the direct action of biting winds or actual frosts. And cultivators should be especially careful to avoid both.

II.—Site.

THE question of site is much influenced by local climate and geographical position. In the southern portions of Britain, for example, the range of site is greatly extended. Peaches will thrive in eastern or western aspects as well, and sometimes better, than on southern ones. They may even ripen on walls with several points to the north. Whereas in the

northern parts of the United Kingdom it may be laid down as an axiom that peaches and nectarines cannot be perfected unless on southern walls, or those with a few points to the east or west of south. But in the choice of a site the inclination of the ground must be taken into account as well as the aspect of the wall. The ground should slope, if possible, to the south or west. Such a disposition of the ground greatly improves the local climate, and gives those necessary qualities to the site so valuable to a tree like the peach, sunniness and warmth. Once more in regard to the site it should have a dry bottom as well as a warm outlook to the sky. A wet soil will go far to ruin the best site. The excessive evaporation of water from the surface of the earth not only cools the latter, but also the local atmosphere over it.

III.—Soil.

Soil has a much closer relation to site than is generally supposed. So much so is this the case that, given a south and west wall, with suitable soil against it, and the site can hardly prove unsuitable. But let the soil be of bad quality, and especially let it be saturated or bottomed with stagnant water, and such earth conditions will go far to neutralise the finest site in the country. Throughout the greater part of the United Kingdom the danger from the opposite extreme—that of dryness of the roots—is but slight indeed. It does, however, sometimes occur on thin soils—on the chalk or over the gravel—and there are two obvious remedies against it: one is artificial watering, and the other, and by far the best, the artificial deepening of the soil. Artificial watering generally fails from two causes: it is insufficient in quantity and intermittent in its application. Of course we are not writing of such waterings as accidental droughts or common cultural necessities may render necessary on any soils, but of such waterings as may be needful from radical faults of the site chosen, arising either from the scarcity or character of the soil or subsoil; and unless where an unlimited supply of water can be laid on from mains, such sites are never sufficiently watered. And even where this is the case, the roots—from ignorance of their actual condition and other causes, are apt to be subjected to an alternate series of parchings and floodings that are almost sure to be destructive to the health of the trees and most damaging to the quality of their produce. A far simpler, and in every way better, mode of preventing the evil of excessive drought at the root of peaches is the removal of so much of the unsuitable soil or subsoil as will furnish a border or bed of from 24in. or 30in. to 36in. under the roots. Such a mass of suitable soil will be almost sure to

retain a sufficiency of moisture for peach trees in our climate. This brings the cultivator face to face with two of the most vitally important matters within the entire range of peach culture—the quality and quantity of the soil best adapted for peach-growing.

The greatest practical difficulty in regard to the cultivation of superior fruit, arises from the soil. It is obvious that, unless the roots prosper the tops cannot, hence the importance of good soil. The two extremes of sand and clay must be avoided, but of the two sandy soils are the most unsuitable for the peach. What cultivators call a holding calcareous loam, that is a loam slightly tenacious, on account of the amount of clay it contains, and more or less impregnated with lime, is the most suitable of all soils for peach culture. If this description of soil has the additional recommendation of being "maiden," that is, such as has not previously grown fruit trees, it is as near perfection as can be. The surface spit of an old common, or of meadow land, laid up for six months before use with the scant herbage, and all its fibre intact, forms a model soil for peach growing, and to this nothing should be added. Many spoil the finest soils by officious efforts to improve them yet more, and further—cultivators, above most people, need to learn thoroughly the difficult art of letting well alone. Having obtained a good maiden soil, do not ruin it by additions of manure of any kind, not even of crushed bones nor dust. Farmyard or cow manure may give a fillip to the trees at first, but the effects are injurious in the end. Good soil, like good wine, needs no bush. When its growing power gets somewhat exhausted by years of use, it may readily and rapidly be enriched up to any desired extent by the application of top dressings and the use of liquid manure. These leave its mechanical texture, the most valuable quality of soils for fruit culture, intact, while all solid manure, with the exception of inch or larger bones, tends to break down texture, and so consolidate the earth into excessive solidity.

But it is comparatively seldom that these model soils can be commanded in sufficient quantities to form the entire borders. Hence, compromises have to be adopted. Frequently good soils will be found on the spot, loams of fair quality, or subsoils that will give staying properties to the lighter surface soils. Where such exist, great advantages may be derived from the due and careful admixture of tops and bottoms. The best of borders for peach trees may not seldom be formed in this way. Beneath a light sandy sort of soil it is no uncommon thing to find clay. A third of the latter, duly incorporated with the former, may form a capital soil for peaches. The best soil may be of too thin a strata to grow good peaches. It is a simple and easy matter to add a third or more to its depth. The most common mode of making good borders for

peaches is by a due admixture of the soil found on the spot with as much maiden loam as can be had. A half-and-half of this kind generally succeeds well, or even a third of new loam to two-thirds of common garden soil.

One thing must be carefully guarded against. No soil should be used that has grown peaches, or indeed any sort of stone fruit, or any other fruit trees before. In the replanting of peaches in old gardens, the entire soil of the borders should be removed bodily. This involves considerable labour, but it is labour that pays well. The expression peach, plum, or pear sick soil is full of serious practical import. The theory of such a phrase may be difficult to explain, the fact of such sickness is patent to all cultivators. It is probable that such sicknesses of the soil as disqualify it for the continued production of any given crop in succession arises from the fact that the continuous demand made on the soil for materials essential to the well being of certain species of plants, exhausts it of those qualities. Hence, soil sickness is simply the exhaustion of certain powers and qualities essential to the growth of certain crops. There is, therefore, no reason why land unable to grow peaches should not be able to produce fine peas or other vegetables, and few processes can be more simple and more easy than the transference of part or whole of the old peach borders into the vegetable quarters, and the removal of the latter into the border. These exchanges would prove profitable to both. The peach sick soil would grow the sweetest peas; the pea or potato soil, quickened, sweetened, its richness, somewhat moderated by a liberal infusion of maiden loam, would often grow the finest peaches. The whole mass of the quarters would thus prove fresh or maiden earth to the trees.

As to the quantity of soil needful to grow peaches to perfection, the first point is one of the proper depth, that may range from 18in. to 36in. The first is essential to success, the second should not be exceeded in our climate, unless on bottoms especially dry, and in the warmest and most favourable localities. In the latter, the question of depth is of little moment. The quality of the climate and of the soil neutralises or prevents all grossness, and dangerously late growths, which are among the worst evils of deep borders in less favourable situations; in these, however, a fleet border on a dry bottom is indispensable to success, as these conditions are highly favourable to medium sized growth and perfect maturity. From 18in. to 2ft. of soil may, however, be considered as indispensable to protect the trees from extremes of drought and rapid exhaustion, which are two of the most productive causes of insect pests and diseases among peach trees; 30in. is a good depth of border, and is probably that most generally adopted.

As to width of border, that is far more varied than the depth. It varies from 3ft. to 24ft. The old-fashioned plan, which was sound in theory and proved very successful in practice, was to regulate the width of the border by the height of the wall. This is a general principle applicable to all cases. It may be modified at will to adapt it to every possible necessity of individual cases, but the leading principle of the common rule should never be lost sight of. It was based on the now well known law of the correlation of force and development. Thus: Root and top growth, under equally favourable conditions, may be held to be equal and alike. That is, the one will run as far and ramify as much as the other. Hence, for every foot of wall for the top of the peach, it should find a foot of soil for its roots. It must, however, be borne in mind that we measure walls by foot superficial, and borders of necessity by cube measure. Hence the roots find more room in the borders than the boughs on the wall. In practice, however, each plane of roots may run as far along any part of the border as the branches run up the wall, and in wall trees there can be little doubt that the roots underground far exceed in numbers, and probably also in extent of ramification, the branches on the wall. Be that as it may, it is important that peach and nectarine trees displayed on hot dry brick walls not seldom exposed to an exhausting temperature of from 80 deg. to 100 deg., should have a sufficient depth and superficial area of root run to enable them to make good the dissipation of their fluids almost before it is absorbed or elaborated. Evaporation proceeds with marvellous energy from peach trees on walls on hot days, and should food or moisture at the roots fail, the results are most injurious. There is no surer and more certain mode of preventing such failures than by the simple and easy one of providing sufficient soil of the proper quality at the time of planting. Ten or 12ft. is a fair average width of border for peaches and nectarines. There is often danger and injury to peach trees from making the borders too wide. With rather narrow or medium sized borders, the cultivator cannot forget that the soil belongs to the peach primarily, if not solely; but wider borders of 18ft. or 24ft. are often supercropped with vegetables, with little regard to the presence or well doing of the peach; masses of the finest roots are torn up in the digging, and not unfrequently heavy dressings of rank manure are also dug in annually. The results too often are suckers from the root, and canker among them, and on the top of the trees an arrestment of branch here, and a gross development there, according as the feeder of the one has been severed, and of the other overfed, and other evils ending in the undermining of the health, the destruction of the symmetry and life of the tree. Whether peach tree borders are made narrow or wide, it must never be overlooked amid the

high pressure of close cropping that they are primarily feeding places for the trees, and that all super-cropping must be consistent with, and subordinate to the primary use of the borders.

The risks and dangers of super-cropping are very great. To avoid them as much as possible, the borders are sometimes made only 5ft. wide. These are uncropped altogether, or, where this cannot be afforded, a row of cordon plums or pears is planted about the centre of the narrow borders, and carried along a wire 9in. or a foot from its surface. The borders are thus wholly devoted to the roots, which seem to agree very well together. The productive power of these narrow borders can easily be sustained by manurial mulchings, and a few soakings of sewage during the growing season. The system may readily be extended over a 10ft. or 12ft. border by multiplying rows of cordons of various heights, so as to slope from the wall to the walk. Lines of cordons, from 18in. to 30in. apart, might thus clothe the borders, which would then be sacred to the roots of the trees.

One more point in regard to peach borders, a gentle fall of 1in. in ten or twelve feet towards the sun is a great advantage in most localities. The sun's rays have more penetrative force when hitting the soil on the rise. The fall is also of much service in shedding off a large portion of the autumnal and winter rains, and altogether adds to the merits of the borders.

IV.—Method of Planting.

THE mode of planting is simple enough. Expedition in the process is one of the surest means to success. All preparations should be made beforehand, so that as soon as the trees are lifted, or received from a distance, they may be immediately planted. The old plan of digging a sort of irregular hole, and thrusting the roots in roughly, and ramming them down with the heel, was about the worst possible. The roots were often bruised or broken, and almost always matted or crowded together in a heap. Nothing could well be worse than either for the trees. The entire earth should be removed to as wide an area as the roots are likely to extend; the bottom of the hole made perfectly level; or, if anything, with a slight ascent in all directions from the bole of the tree to the extremities of the roots. The roots should then be carefully and equally distributed over the level base, removing each bruised or broken portion, or end, with a clean short cut in the process of laying out. Care must be taken not to sink the collar of the tree in planting lower, nor to raise it higher than its original ground lines, then cover the roots over with from 4in. to 6in. of fine soil

of such a degree of smoothness that it is not needful either to break it with the spade nor trample it down with the feet in the process of filling up. Should the soil and the weather be of ordinary character, the trees will need no water in November. Should either be dry, a good watering home, as it is called, is useful. A slight mulching of long litter or manure is useful over the soil to exclude drought and frost, and the planting is completed. No treading down of the soil over the roots should be indulged in, time is the gentlest as well as surest consolidator. This and the rains or artificial watering does its work well without direct mechanical pressure, and never mutilates nor bruises the roots. The trees should be made fast to the wall with such a loose tie, however, that it may slip down with the natural subsidence of the ground without hanging the plant. This last is a fruitful cause of root ruptures, and proves a great source of failure.

As to the trees to plant these are of different sorts, as maidens, trained dwarfs, riders, cordons, and other forms, illustrated and described under our chapter on training. Each may prove best under certain circumstances and conditions. But as to the age of the trees the younger they are the cheaper, and also the better. Hence what are termed maidens, that is, trees one season only, or at most two, from the buds, are to be preferred. These will only average about a fifth of the price of what are called trained trees, and are in many respects better. The cultivator has the advantage of youthful vigour, and may mould the young tree in accordance with his skill and fancy. Neither can such trees have been injured by excessive cutting back or other repressive treatment often adopted in nurseries to keep trees within saleable size. The result of such measures often breaks forth in gum, canker or other maladies afterwards. Hence, upon the whole, maiden trees are the best to plant, and are likely to lead to the most satisfactory results.

The distance apart must be largely regulated by the height of the wall, the nature of the climate, and the mode of training adopted. But as trees are cheap, and wall space and garden ground valuable, it is as well to plant the trees as thick again, or even more, at first than they are meant to be left permanently. The first few crops will much more than pay the expense of the supernumeraries and planting, and they can be removed to make room for others. Permanently fan shaped trees should not be planted closer to each other than from 10ft. to 15ft. In localities congenial to the peach, some cultivators would prefer 18ft., 20ft. or even 24ft., and on all walls exceeding 9ft. in height, a rider peach with a clear stem from 4ft. to 6ft. high should be planted midway between the permanent dwarf trees. Where the wider distances are adopted for the latter,

an additional supernumerary tree might be planted on either side of the rider, and half way between it and the permanent dwarf. These might be allowed to grow very freely, and yield as much fruit as possible, as their form, &c., is of less moment than that of the permanent trees, in the culture of which, for the first few years, form should have precedence of fertility. As an average distance for fan shaped trees on walls 10ft. high, 15ft. may safely be accepted. Between each dwarf a half or tall standard, or rider should be placed. During all the earlier stages of the dwarf tree the tall ones would clothe the upper part of the walls. By the time the two have met the cultivator will have discovered how his land, climate, and treatment agree with the peaches and nectarines, and will easily decide whether the rider is to be cut out or not. It is often more profitable to retain both trees, and thus concentrate their energies into smaller compass. The many severe winters and springs of recent years have induced many to plant closer, as affording a better chance of a crop. Sudden frost late in the season not seldom kills not only the flowers and twigs, but considerable boughs. Under such circumstances it is well to have other trees near at hand to grow up the gaps thus made. Such risks are now so frequent that they should be taken into account in determining the distances between peach trees on walls. Few things are more offensive to the eye or more unprofitable to the pocket than the occurrence of gaps on peach walls, and if closer planting will assist in lessening their numbers and reducing their size it ought to be adopted. Where the peach grows indifferently, and is specially subject to accident, the permanent dwarfs might be planted 10ft. apart with a rider between them. This would furnish the wall with sufficient root power almost to defy serious loss from the accidental break down of the trees, though it must be admitted that walls furnished with such small trees lose much of the dignity and grandeur of those furnished with the more noble triumphs of the cultivator's art and skill, perfect peach trees covering the entire wall, placed at intervals of 15ft., 20ft., or even 24ft. apart.

For cordon trees a yard apart is sufficient. This affords a good space between for the production and full exposure of sufficient wood and leaves to keep the trees in robust health. This mode of growing the peach has made but little progress in the open air in England. There seems no good reason for the prejudice that seems to exist against it; it is admirably adapted for small gardens. There are thousands who have no room for a stately peach tree, that might find a cozy nook or corner for one or half a dozen cordons—one posted here, another there, about their small gardens. Peach trees are highly ornamental, as well as useful. There is hardly a flowering plant, unless it be the rose,

that can rival the soft pink of the peach blossom. Some of the larger flowering varieties are also highly ornamental. The foliage is also of a pleasing form, and a very distinct and refreshing green colour; and the fruit, in form, colour, finish, is very handsome. There is no reason why, on the highest principles of horticultural taste, the peach should not take its place with the rose, jasmine, honeysuckle, pyracanthus, cotoneaster, wisteria, &c., on houses and outbuildings, as an ornamental plant. Run up as a tall cordon among or between other plants, it would furnish a new pleasure in the spring and the autumn, and also bring a fresh shade of green, one that may be said to be wholly wanting in our present race of plants for the clothing of our dwelling houses throughout the summer. Pink cordon peaches and nectarines, standing up as pillars of beauty between golden panels filled with bursting buds of Marèchal Niel rose, would add a new sensation as beautiful as it is rare to many a garden.

GENERAL CULTIVATION.

In addition to the instructions already given in the chapters on propagating, pruning, training, and planting the peach, a good many more details of culture remain to be noticed. It will probably be most convenient alike for reference and a handy guide to practice to include all these in this portion, with the exception of insects and diseases, which will have a concluding chapter to themselves. This division will, therefore, treat of such important matters as protection in all its phases, root and top watering, and mulching and super-cropping the roots.

I.—Protection.

The peach being at once a precocious and tender tree, its due protection against the vernal rigours of our climate claims our first notice. If we can save its blossoms and young fruit from destruction in the spring it can generally take care of itself throughout the rest of the year. The foundation principle of all protective expedients rests on their efficiency as heat conservers rather than cold excluders, using the latter term in a popular and not a scientific sense. Protection shuts the heat in rather

than the cold out. In protecting our peach trees we wage war less against an active enemy attacking them from without than in favour of our best ally, heat, already fighting from within to save our trees. In a word, the object of the cultivator is to protect from the loss of heat already stored in the trees, the brick wall, and the ground contiguous to both, from within. We have been careful to lay down the general principles of efficient protection, as it shows the importance of the old system, once so general, in unfavourable localities, but now, without any valid reason, almost obsolete, that of heating peach walls when necessary with flues or hot-water pipes. A very small addition of heat to walls on a frosty night proved sufficient to protect peach trees in bloom from destruction, inasmuch as the heat was applied exactly where it was needed to the trees on the walls to which they were so closely attached. Thus it often happened on flued walls that while the blooms that hugged the wall escaped those that stood out from it were destroyed. The same thing still happens with unflued walls, proving that the wall and the trees themselves are the sources of heat. These flues added comparatively little to the expense of the walls, as, though flued walls must be thicker than those that are unflued, the large proportion of hollow spaces reduces the number of bricks. Neither did they cost much for fuel, for one never thought of lighting the fires until the trees were nearly in blossom, nor then unless when severe frosts or bitingly cold winds rendered them necessary.

In mild seasons, for example, no fires would be needful till after the middle of March, and gentle fires from that period till the end of the month; a few perhaps in April, and two or three during the annual cold snaps about the middle of May, would almost certainly save myriads of fine peaches, nectarines, plums, and pears that would otherwise utterly perish.

No doubt there was some risk in the use of flued walls, and great dangers in their abuse. They required care and skill in their working, and so does almost everything else. But with careful use and the employment of no more heat than was needful, there was no reason why flues should either half roast the trees or cause them to fall a prey to red spider before their leaves had half performed their function.

Besides, all the evils connected with flues were abolished by running a few hot-water pipes along the bases of honey-combed or pigeon-holed walls. The heat was then perfectly safe, and by the aid of a few evaporating pans could be made as moist as desired. The mere hollowness of the walls when unheated gave them a decided advantage over solid walls, as the air inclosed parted with its heat slowly as the external surface of the bricks was robbed of its heat by the external

atmosphere, and thus a superior wall temperature was generally maintained throughout the longest night.

But slightly heated, covered with the thinnest screen of canvas, or even uncovered, flued or heated walls were generally able to conserve and diffuse sufficient heat so as to preserve peach and nectarine blossoms from destruction.

But if the primary object of protection is the conservation of the heat of the wall, it follows that glass is but a weak protector at the best. Of course, when glass is so closely fitted to the wall as to inclose and retain a considerable amount of heated air, that air baffles, and for a considerable time resists, the mass of the atmosphere and the open sky outside to establish an equilibrium of temperature between the trees and surrounding objects. But as clear glass offers little resistance to the radiation of heat, the heat of the wall and of the inclosed air ultimately, and that within a comparatively short period, sink to the equilibrium of the general mass of air.

But most glass walls are veils, or top screens, rather than close cases. They seem constructed on the principle of keeping cold out rather than of keeping heat in. The fact is, they can do neither to much purpose. The heat of the wall impinging against glass passes right through it. Supposing cold as the opposite of heat for a moment, the cold of the sky, radiating against a glass coping or screen, passes right through it. A compound process, equivalent to burning the candle at both ends, is thus at work on the heat stored in the wall, the trees, and the soil. And it is little wonder that the result is the tree blossoms are blackened and killed by the frost, notwithstanding the glass protectors. A coating of common whiting, slightly darkened into a grey colour with a dash of soot or other colouring matter, doubles, trebles, or more, the protective power of glass screens or copings, while a screen of bunting canvas or an opaque mat over the glass acts like a cloud spread athwart the sky on a clear frosty night, and completely checks the radiation of heat from the trees and the walls, and protects them so efficiently as to save the crop from being destroyed under all ordinary circumstances.

Before proceeding to other means of protection, it may be useful to advert briefly to means that are seldom employed, and that are very effective against strong winds in the spring. These consist in building serpentine walls, with easy curves, instead of straight walls. There is a great saving of material, as a 9in. wall on the curve is as strong as a 14in., 18in., or 21in. on the straight. They are also more beautiful, especially for small gardens. The curves may be equal, or the southern recess, for peaches, may be double the size of the convex curve on the same side, which may be clothed with pears. Alternate curves of 10ft. and 5ft.

would, in such cases, be a good proportion. The trees in the bays of such walls almost wholly escape winds, as the latter rush along in a straight line across the convex line of curves.

Another mode of compassing this permanent protection from winds consists in the erection of panelled walls. These form excellent boundary lines between small gardens, and are far more ornamental and but little dearer than straight walls; for it is obvious that the extra bricks of the projecting pillars may be safely taken out of the panels. With a projection of 4in. or 9in. at intervals of 8ft. or 10ft., the trees in the panels are protected from the sweeping force of the wind rushing along in the line with the wall, and it is such that do most harm in the spring.

But of course the majority of walls are straight, and for these it is an easy matter to make and fix breaks, formed of wood, glass, canvas, and mats, to throw the wind right over the wall, or sharply cut its currents into such short lengths as to break its destructive force. These break-winds should be from 2ft. to 30in. wide at their base, and may taper in to a breadth of from 6in. to 9in. at the top of the wall. Narrow walls, 9in. or 14in., are not seldom built with such stays as buttresses, and their protective power on the face of the wall is as apparent as it is valuable.

Other modes of protection consist in the application of permanent coverings of semi-transparent textile fabrics, to remain on the walls night and day, till all danger of frost is over; and the use of thicker materials, such as canvas, cloth of any kind, mats, wooden shutters, &c., to be applied during frosty nights and removed by day. The first materials are the best and most suitable for amateurs, few of whom would be at the trouble needful to command success with movable protection. Netting of all shapes and sizes of mesh and material is perhaps the best of all the permanent protectors, suspended from the top of a wide permanent or portable coping, doubled or trebled, according to the quality of the net and the size of its mesh, and carried down to the ground, or nearly so, within 18in. or 2ft. of the trees; such a screen almost baffles the energy of radiation. The heat removed from the trees is arrested by the screen of netting, and most of it returned on the principle of reciprocity that governs the laws of radiation. Thin canvas is the next best permanent protector. Next to these come screens of spruce and other boughs, fern fronds, dried asparagus tops, loose straw, &c. All these fixed modes of protection have a compound action, each of which is equally valuable, and the nett result of both is the preserving the walls and the trees cooler by day and warmer at night. In a word, the one function saves the trees from being destroyed by the

forcing—forwarding force of the spring sunshine; the other saves them from the hardly more destructive energy of spring frosts.

Thicker and more opaque protectors must perforce be removed by day, or the trees would be blanched into such weakness that they would not only lose their fruit but also their health, and probably also their life. An exception may, however, be made in favour of opaque copings. These, whether formed of wood, common Russian or other mats, or thick painted glass, projecting 18in. or 2ft. over the wall, will often save a crop of fruit without further trouble; and if not applied till the trees are almost in flower, and removed immediately, all danger from frost is over; they do little injury to the trees. This is the chief reason why peaches, nectarines, and apricots generally bear so freely on the gable ends of fancy cottages, on the walls or sides of barns or outhouses. The roofs of these project so far as to effectually protect the trees from the killing severities of spring frosts.

The attempt to neutralise the intensity of the cold by placing water in shallow tins at the bottoms of the trees has not been sufficiently successful in practice to be worthy of serious recommendation. A certain amount of heat is doubtless liberated from water in the act of freezing. But this is rather too infinitesimal to sensibly affect the local atmosphere in favour of the trees. As soon as the ice is formed the water would tend to cool the air, so that to be of the slightest use the ice must be skimmed off as soon as formed, and the plan is altogether too chimerical in its practical results to be advocated here. The stems of peach and nectarine trees are often much benefited by being protected alike from frost bite and sun stroke by a piece of matting or hayband being tied or twisted round them.

II.—The Root and Top Watering.

Few plants suffer more from a scarcity of water at the roots than these trees. Not only does drought favour the production of fungi on or about the roots, but it gives such a severe check to growth as produces mildew and other evils on the leaves and branches, and diminishes the size and lowers the quality of the fruit. Peaches and nectarines on walls, with all their leaves and fruit exposed to the sun, must have a continuous supply of food to make good the losses of evaporation and elaboration. Stimulated by light and heat, the energy of these processes and the expenditure of food on growth may become excessive. As long as the balance between waste and supply is maintained, the activity of these processes is a clear gain to the tree. But let the demand for food

greatly exceed the supply, and exhaustion immediately begins. And water is not simply the drink of plants, but their food, or at least the medium through which they obtain their supplies of the latter. In dry soil plant food, if present, cannot be assimilated by the roots of plants. And whether these roots absorb the elements of their nutrition direct from the soil, or first of all render them more absorbable by the secretion of something analogous to gastric juice, either way abundance of moisture in the earth and in the plant is essential to vigorous and continuous vegetable nutrition.

Checks from drought mostly occur when growth is most vigorous. The injury of an arrestment of growth corresponds to the thoroughness and duration of the stoppage, *plus* the previous rate of growth. Hence the importance of carefully noting the state of peach borders during the growing season, and watering them so as to prevent checks to growth from drought. It does not do to wait for the trees to hoist signs of distress. Long before this is manifest the trees or the crops have suffered. It may be stated almost as a general principle that in droughts of more than a month's duration, occurring from May to September, the majority of peach borders would be benefited by at least one good soaking of water. On borders properly drained, as those devoted to peach culture should be, water will seldom do any harm throughout the growing season, while the want of it often ruins the crops and cripples the trees.

The sort of water to use is of less moment. Where the soil is good, the wood sufficiently strong, and the leaves large, soft rain or river or pond water is best. On soils poor as well as dry, with weakly wood and pinched like leaves, such as one so often meets with in small suburban gardens, house, stable, or yard sewage, or manure water, is to be preferred. Capital manure water may also be made by placing a bushel or so of pigeon, fowl, pig, or cow dung, into an old wine butt or beer barrel, stirring it well up, and applying it to the border either in a muddy or clear state. In the absence of these, soot and guano form capital manure water for peaches. Whatever enriching matters are used care should be taken not to apply them too strong. Little, weak, and often are the safest rules for the use of these and all other stimulants. Frequently peach and nectarine trees that may have done well throughout the earlier stages of their growth show an inability to finish a heavy crop well. It is by far the safest plan to lighten the load. But frequently the trees may be so assisted by the copious application of manure water as to be made to finish the fruit well, without unduly weakening the tree. Waterings for this special purpose must be thorough and seasonable, the best time being about six weeks before the fruit is ripe. For a month or so before gathering no manure water should be used.

The surface watering of the tops of peaches is perhaps more serviceable than the watering of their roots. The heat of south walls is so excessive that on the evening of cloudless days the leaves feel flaccid to the touch as if quite exhausted. And so they are. One of the best means of recovering vegetable as well as animal life is a shower bath, cold or tepid. Apply this to the drooping trees any time from five to eight o'clock p.m. The later the better (though convenience in suiting workmen's time generally causes the shower bath to be used too early), and the effect in stiffening and strengthening the leaves and shoots is marvellous. The water, if copiously applied, as it should be, reaches and moistens every part of the tree, cools the walls, and strengthens every portion throughout the night to bear with less injury the strain of a long day's sun on the succeeding day. During hot weather this heavy overhead watering with the garden engine should be given every day. The more water in reason that is used the better the excess falls upon, moistens, and cools the ground. This water, raised by the sun during the day, genialises the local atmosphere around the trees, when it is most needed, and thus assists the peaches to grow into larger size and to develop finer qualities. As a mere sanitary agent in keeping the trees clean and giving a short shrift to red spider or aphides, &c., that may be lurking about ready to attack the trees, this daily shower bath in hot dry weather is invaluable.

III.—Mulching and Super Cropping the Roots.

It is most convenient to discuss these two together, for practically and theoretically they are closely related. Mulching covers the roots with dead matter, super cropping with living, and so far as merely protecting the surface of the border from excessive drought, heat, and cold, and the waste of its substance or strength by wind and air, the result is very much the same whether we mulch with dead substances or cover with living crops. It may also be assumed that in general some kind of super covering of roots is desirable and useful. Nature even covers her roots by the overshadowing of branches or stems, and also where that is too thin or insufficient, as it mostly is, by a close growth of inferior and miscellaneous plants. We find nothing in nature analogous to a peach, vine, or other tree border of bare earth. Surface coverings conserve the moisture and strength of the ground, and also preserve the roots from sudden and violent extremes of temperature.

The worst and chief fault of covering with dense living crops is that, in digging the ground in preparation for them, the peach roots are too

often mutilated and destroyed, and the crops themselves compete with the roots of the trees for the food and moisture designed for the trees only. The best covering for such borders is doubtless one of cordon trees, as already pointed out. These perform most of the more important functions of a good mulching material, with little or no injury to the roots, and may often yield a crop of fruit almost as valuable as that of the trees on the wall. Dead mulchings may also be of two kinds, which may be designated as active and passive. The latter may consist of litter of any sort, such as rotten straw, fern fronds, cocoa fibre refuse, long and weather washed manure, &c. Its chief or only function is to resist the extremes of cold and heat and conserve the strength of the soil. Active mulchings consist of manures more or less rich, that feed and enrich the soil in addition to performing all the functions of the passive ones. They are of great service on poor exhausted soils, and often reinvigorate exhausted trees or minimise the evils of overcropping. Either character of mulching, that of conserving or enriching, may be best, under different circumstances. This mode of enriching peach borders by the employment of rich top dressings is far better than the use of any manure in the original composition of the border.

The soil itself may be converted into an equivalent for mulching by simply keeping an inch or two of its surface loose by frequent stirring. The mass of the borders for peach trees should be pretty firmly consolidated. They should neither be dug nor forked up at all deeply. But in the absence of any proper enriching or surface cropping it is often very useful to the trees and conservative of the best qualities of the soil to preserve a loose surface.

CROPPING.

I.—Setting.

THIS is generally effected without any direct help from the cultivator in the open air. In districts where bees are scarce, however, it may be well to go over the blossoms a few times, touching each lightly with a dry camel hair pencil. This will be sure to distribute the pollen freely. If bees are seen on the flowers leave the work to the bees, as they will do it better. During dry weather, too, several overhead syringings may be given when the trees are in flower. For fear, however, of adding to the power of frosts over the blossoms, such syringings should be given about

eight o'clock in the morning, and are by no means to be confounded with the summer shower bath already commended. Such sprinklings have been held by some to be useful in washing the pollen home. But their potency, if any, is far more likely to arise from their refreshing effect on the stigma and embryo fruit. Close observation over a series of years shows that the finest sets of peaches have mostly followed a showery flowering time. There seems, therefore, good reason for creating artificial showers when the clouds withhold them, and experience is in favour of doing so.

II.—Thinning.

THIS, of necessity, follows a free set of fruit; for a peach tree fully furnished with bearing wood will probably set ten or twenty times as many fruit as should be allowed to swell. The French, who have a superior climate in the southern parts, and are altogether more skilful and more venturesome in peach-growing than British cultivators, boldly practise bud-thinning to prevent such excessively profuse sets of fruit. But this should not be indulged in in our climate. What with the frosts and the birds, our fruit buds are not seldom over thinned. And even after the fruit are set they are by no means out of danger. As seasons have gone of late years, peaches should not be thinned till the end of May. It is hardly possible to pronounce any of them safe till then. Neither do the young fruit drain the trees much at first. The severe cases of overcrowding may be so much thinned as to prevent injury or malformation from mechanical pressure. Beyond that, leave the young peaches till all danger from killing frosts is past. During their earlier stages of growth they perform functions analogous to leaves, and draw little strength out of the trees.

At the first thinning, towards the end of May, it is also wise to leave almost a double crop, for peaches not seldom take the matter of the final thinning into their own keeping. Unfortunately, too, our selection and the trees' final selection after or during the stoning period is not always identical. So that if we thin a crop before stoning, and the tree —which is probable—casts some of our fruit in the process, we may be left with a light crop at the last. As soon as the fruits are stoned the cultivator should proceed with a firm hand to his final reduction.

The exact distance to leave peaches apart can seldom be determined or carried out with mathematical precision; faults in the setting and the chapter of accidents prevent that. Peaches also vary much in size and weight; at a rough guess it may be stated that a peach to every three square inches is a heavy crop; and from four to six is preferable. With larger sorts 9in. or a foot apart would not prove excessive. Fine

fruit, rather than many, should be the rule. Four peaches the weight of twelve will probably contain double the amount of edible fruit, besides being immensely superior in their appearance.

In thinning, too, the most perfect fruit only should be left, and those posted in the best positions where they may swell freely without contact with other peaches, branches, bricks, &c. Often the finest fruits are spoilt for lack of attention to such trifles, or the foresight to anticipate the space required as they reach full size.

III.—Swelling and Stoning.

This is often rapid, should the tree be healthy and the weather genial. Care must, therefore, be taken, especially during the first swelling, that the young peaches are not allowed to bruise each other. Towards the end of the first swelling is a suitable time to assist the tree with manure water, top dressings, &c., as the process consumes much food. During the second swelling the fruit makes rapid progress and the strain on the tree is great. The process is much facilitated and the peaches greatly enlarged by overhead and root waterings during the earlier and gradual growth of the peaches towards full size and maturity. It will now also readily be seen whether an excessive crop has been left, and if so, part of it, though so late, may still be removed.

Stoning tries the patience of cultivators, especially amateurs. Not only is no apparent growth made, but a good many fruits are often thrown off. No direct efforts are possible, either to hurry peaches through this halting, critical process, or prevent the fruits from falling. The latter is generally a proof that too heavy a crop has been left, or something is amiss at the roots or wrong in the treatment. Masterly inactivity is the safest practice now. The peach is exceedingly busy, forming and fortifying its seeds within, and therefore resents all interference from without. When this process is completed it is more amenable to external influences, and the cultivator, as already stated, may do much to help it during its second swelling, which begins the moment the stoning process is sufficiently advanced.

IV.—Ripening.

In suitable localities and genial climes the sun and the atmosphere complete this process with little aid from the cultivator. A few leaves may be pushed aside from the fruit to allow of more light and heat to develop the full lusciousness of its flavour. In less favoured localities peaches would often be much better finished were a little extra trouble

taken. Where flued walls are employed, their aid for a few weeks in the autumn would prove as serviceable as in the spring. Glass screens, again, to resist the frost, would be of equal service in giving the finishing touches to the maturation of the fruit. Common garden frame lights with or without the frames may often be set up against peach walls in the autumn with the happiest results. Such contrivances are easily applied and result in the most complete success. A good deal may also be done by placing common roofing tiles on the borders in front of the walls. This reflects more heat on to the trees and helps to mature the fruit. These may also be so placed as to shed off the water, and root dryness, if not carried to an excess, assists the perfect ripening of the fruit. Neither the peach nor nectarine should be grown in unfavourable localities, or some special means must be used for ripening them, as in a semi-ripe condition the fruit is simply uneatable.

V.—Gathering.

This apparently common operation is quite a delicate art. There is hardly a better test of skill in a practical horticulturist than his mode of handling such fruits. The statement may excite surprise to many, for perhaps in the majority of gardens peaches and nectarines are not gathered at all. They are allowed to fall into a net, or muslin, or canvas screen, set for them at or near the base of the wall. This practice is one of the most fatal mistakes in peach culture. Each peach ripe enough to fall of itself has already passed its meridian of perfect flavour. The glory of its flavour, the indescribable richness and sparkling freshness of its aroma, have already departed. It is like a stale glass of champagne. Every hour, every minute, it lies there in the sun and air it becomes more fit to be food for pigs than a delight to the epicure and a pleasure to all who know what a peach or nectarine should be. Each fruit should be gathered a day or two before it would fall if it is to be eaten in perfection.

As to the mode of gathering, it is difficult to describe, though easy in practice to the initiated. The hand should be specially clean and soft, and if not soft covered with a kid glove. The peach is then embraced by the fingers and taken into the palm of the hand, grasped lightly though firmly, so as not even to bruise its delicate down. The fruit then receives a gentle wrench, and should be laid in a basket lined with cotton wool, and carried carefully in single layers to the fruit room.

Even the time of gathering is important. Peaches and nectarines should not be gathered when heated with the sun. From 7 to 9 a.m., before

the dew is hardly off them, is the best time. The fruit are then fresh and cool, and if stored in that state will appear at table in higher perfection than gathered at any other time or in any other way.

VI.—Storing and Packing.

MANY will object alike to the phrase and the practice. Both are, however, of great importance. These fruits are seldom best eaten off the tree. The majority of peaches gathered as above described will be improved by several hours' or days' keeping. Nectarines keep longer than peaches. Late ones not perfectly ripened on the trees may often be brought to the highest perfection by storing for a fortnight or three weeks in a warm room or vinery. The writer has also kept October peaches for three weeks after gathering and found them excellent. With the majority of peaches and nectarines such long storage is neither possible nor desirable. But neither are most of them so perishable as is generally assumed. They should be covered over with tissue paper when in the fruit room, and no sharp current of air allowed to pass over them. The room for storing peaches that are ripe cannot well be too cool, and peaches kept a day or two in such rooms are almost as grateful in warm weather as ice, and form a striking contrast to that insipid mixture of hot peach juice and stale sunbeams which is characteristic of too many peaches hurried off to the house as soon as gathered on warm afternoons, and placed at once on the dessert table.

Packing is also a delicate operation. Each fruit should be enveloped in soft tissue paper and placed in a round or square hole, a little larger than the circumference of the fruit. It should be surrounded on all sides with a soft elastic buffer of wadding or cotton wool. Thus protected by partitions from pressure or contact with all other fruits, and sheltered from the tin or wooden trays by an elastic buffer of wool, peaches may be sent throughout all parts of the United Kingdom with little or no injury. The general method is to have a series of trays thus furnished with fruit; packed one above another in a strong box made of tin or wood, each fruit has its own separate compartment; and, if gathered before they are dead ripe, they travel well.

VII.—Serving.

CUSTOM has gone on for years building these fruits up into a pyramid. Beginning with any sized base, according to the size of the dish and the party and the number of fruit at command, layer after layer is built up,

constantly diminishing in numbers until the pyramid is crowned with a single fruit. Eleven or twelve fruits make a pretty dish—thus, six or seven in the bottom layer, four in the next, and one on the top. The effect is pretty if vine, peach, or other leaves are liberally used and skilfully placed. And if the fruit are all eaten at once it matters little how they are served. The pyramidal style also affords a good opportunity for the setting of the colours with good effect in relation to each other, as rose-coloured peaches like the Royal George, to contrast with the delicate cream or milk-coloured fruit of the Noblesse, &c. The pyramid, however, at best is a stiff and formal style, and seriously bruises the fruit and prevents it from keeping or being fairly presentable a second time. Peaches served in single layer, each laid on and encircled with a cushion of green moss or foliage, are less striking to the eye, but in better taste and more easily selected. These flat arrangements of the fruit have the additional merit of not bruising it. This latter is a point of great moment in regard to such fruits as peaches, for not only do the slightest bruises hinder the fruit from keeping, but they likewise lower their quality at once. The bruising of the flesh immediately affects the flavour. The advantages of so serving such fruits might readily be secured by the using of silver, golden, glass, or china baskets, or flattish vases filled with moss or leaves, so as to raise them considerably in the centre. The peaches could be disposed in single layers, and would show up with excellent effect. Single peaches, when extra fine, might also be arranged in small dishes or baskets around the table, and such dispositions of fruit in detail might occasionally at least take the place of the universal flower glasses, which are apt to weary one by their monotony and endless repetition. What more beautiful or pleasing than lines of single peaches, or groups of four or five here and there, within easy reach of the diner? The forms and colours would show to good advantage on the white cloth and against the usual ornaments of plate and flowers. Fruit ought, in fact, to take a far higher place than it has yet done in the substantial decorations of the dinner table; flower and plant decoration have well-nigh run to seed in dining rooms. Old-fashioned diners out are horrified on sitting down, as they fondly hope, to dinner, to find instead the latest example of carpet bedding—sub-tropical gardening—or bedding out, cooled down by rocks of ice, as if the latest style of flower gardening had lost its way amid the giddy mazes of fashionable caprice that has ruined the repose of our lawns and terraces, and had stumbled by accident on to the centre of the dining table. But by using fewer of such tawdry devices, and plants and flowers, and more fruits, visitors would see before them a good dessert, though the dinner might

still be hidden till it appeared on their plates, a thing of shreds and patches. For open-air fêtes and garden parties what more novel or delightful mode of serving peaches and such like beautiful and delicate fruits, than for the youngest ladies to be furnished with the pretty baskets full of peaches for distribution? Who could doubt the genuine favour with which such a method of serving would be received?

CULTURE UNDER GLASS.

THE great use of glass is to render the cultivator independent of climate. It is, therefore, impossible to exaggerate its influence or importance in horticulture. It enables capital and skill to defy outward conditions, and to grow the plants and fruits of the Tropics in temperate or even Arctic climes. To illustrate the importance of glass in peach culture, it is only needful to note how generally of late years the rigours of our harsh springs have blighted all prospects of fruit, and left trees in a crippled, half dead condition. It must, however, be admitted that glass alone is not sufficient to protect peaches against the rigours of our springs. The glass must either be occasionally covered with frost-proof materials, or the heat of the inclosed atmosphere must be added to on all occasions when the external air sinks to 22deg. or 24deg. Fahr. Peaches in flower cannot be exposed to more than 5deg. of frost with impunity, and the resisting powers of glass against continuous frost must not be reckoned at more than 5deg. more. This is a popular but hardly a correct way of putting the matter. For it must be obvious to anyone who will give a moment's reflection to the subject, that the resisting power of glass is well-nigh *nil*. The heat of the sun, the cold of the open sky, alike pass freely through glass, leaving little of either behind in its substance. The potency of glass as a conserver of heat arises from its power of inclosing a body of air. That air is of superior temperature to the general atmosphere. It follows that the resisting power of glass houses will depend upon such considerations as these: The size of the house, or rather its depth, that is, the number of cubic feet of air for each foot of radiating and conducting surface; the disparity between the temperature of the outside atmosphere and the internal air; the duration of that disparity; the freedom or otherwise of the exchanges of heat between the two, and whether or not any internal source of heat is available to counteract the loss by radiation

and conduction. It is not needful here and now to go much further into these somewhat difficult matters, though it was necessary to say so much by way of warning. For if these principles are sound, they explain a good deal that is often very puzzling and distressing, especially to amateur cultivators, whom we are most anxious to guide and instruct in this series of manuals. Not a few of these may hasten to build glass houses for their peaches; many have, in fact, already done so and fancy themselves quite safe. The year 1877 showed many that this was by no means the case. Not a few unheated orchard houses were almost as bare of fruit as the open walls that season. And the same houses were wrecked again the same year by the intense frost of from 15deg. to 17deg. that ushered in the 1st of April. The diversity of experience in regard to the protecting power of glass houses has seemed like an enigma or a game of chance to not a few. Here a house has been frozen, though close by another has escaped unhurt. The foregoing epitome of the principles or laws of cooling explains these mysteries.

In general terms, the larger the house the greater its power of conserving heat. Much also depends on the state of things at the start. A grate full of coals burns longer than a few embers; so unheated houses, shut up early in the afternoon, and filled to repletion with solar heat, will take longer to cool than those left open till the sun has set, and then closed with a temperature little, if at all, superior to the outside air. No doubt this wider difference between the internal and external atmospheres intensifies the energy and adds to the rapidity of the exchanges between the two; but there being a far larger store of heat to draw upon, it takes longer time to reduce the inside temperature to the level of the external air. And in this matter time is everything. During clear nights, when the danger from frost is greatest, the gain of an hour or so in the equalisation of the two temperatures may save the crop.

As a rule, the cultivator may calculate on having his houses filled with heat by day. Of course, in dull weather this source of supply is not available, and it is needful to save every degree of heat with miserly care; but dull days are mostly succeeded by dull nights, and these are safe. It is the clear nights, when the whole atmosphere from bank to sky is robbing the peach house of its heat, that the danger of freezing the blooms is imminent. And the readiest antidote is also one which costs nothing—a house full of heat, secured by early closing.

The next simplest way of conserving warmth is by shutting it in. The glass does this to some extent; being transparent, however, it offers but a feeble barrier to the radiation of heat into the open sky. Place an artificial cloud over the glass in the form of a covering of felt, a mat, a roll of reeds or straw, and the loss of heat is at once arrested. True, radia-

tion is not stopped, but its energy is arrested and the length of its lines so shortened that little or no heat is lost. The heat of the house is radiated to the opaque covering and back, and so the temperature of the house is preserved sufficiently high to insure the safety of the trees.

It is surprising that the use of covering for peach and other houses is not more common. Peaches might be grown on low ground walls or borders sloping to the south or west, and trained on trellises about the size of common garden frames of one, two, or three lights wide. These lights might be placed over the trees from January to the end of May, and then removed. Or, should the season set in cold and wet, and the fruit seem too late to ripen, the portable frames might be again placed over them in September, and kept on till they were ripe. The great advantage of these low trees and portable frames consists in the facility with which mats, litter, and other coverings could be thrown over them. Low peach houses also afford excellent facilities for covering. Rolls of reed mats, the entire length of the roof, are admirably adapted for these purposes, and will carry any peach house safely through the severest spring frosts. Coverings are almost impracticable on the higher forms of peach and orchard houses. These ought, therefore, to be provided with the means of heating in cases of sudden and severe depressions of temperature. A 4in. flow and return pipe will generally suffice for this purpose. Even the old-fashioned flue run along, in or against, the back wall would render such houses frost-proof.

While strongly advocating that cool peach houses, and especially small ones, should be furnished with facilities for heating, or built so as to be easily covered, it is needful to add that the heat should not be used unless wanted; and it is only during spring and, it may be, autumn, that it is likely to be required. At other times and seasons a close glass house affords such facilities for the utilisation and concentration of solar heat that no artificial warmth is needed. So that the expense for fuel is likely to be almost *nil*; while the capital invested in boiler, pipes, or flues will yield a good interest in a sure and certain crop of fruit annually. This means of saving a crop from the rigours of our climate must not be confounded with the forcing of the peach under glass.

To have ripe peaches in March, April, May, and June, sufficient heating surface must be provided to command a temperature of 55deg., 60deg., 65deg. inside, be the external temperature what it may. To do this effectually a good boiler, and four, six, or eight 4in. pipes, would be needed, according to the size of the house, the locality, the time the peaches were wanted, &c. The truest economy in all such cases is to provide a liberal supply of heating surface. The more pipes, as a rule, the less fire is wanted, and hot-water pipes, though dear to purchase, are only

bought once in a lifetime—coal every year. Peach houses for forcing should also be well built and closely fitted in every part, so that no heat can readily escape. This is the more needful, as the greater the disparity between the internal and external atmospheres, the greater the danger of the heat of the house being wasted. Heat is subtle and difficult to confine in any case; it is far more so when we add to its natural subtlety with such a wide divergence of temperature as, say, 40deg.—50deg. inside and 10deg. out. Unless houses are well built, the loss under such conditions that often occurs in the early forcing of the peach is ruinous.

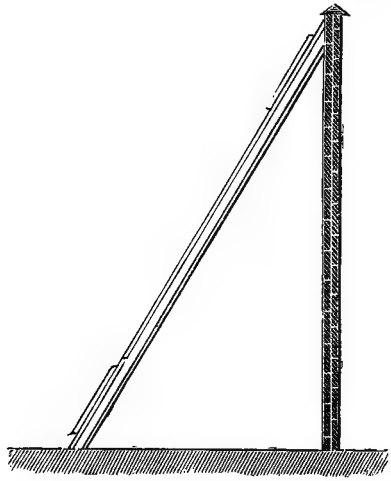

Fig. 52.

I.—Peach Cases.

Glass-houses for mere protective purposes (Fig. 52) are very appropriately called peach cases. They are mostly erected against walls, and vary in width from 5ft. to 10ft. About 7ft. at bottom may be considered a convenient width. They are sometimes furnished with a row of bush trees in front, and if these are kept low they do little injury to the back wall, and add greatly to the amount of produce; the majority of peach cases, however, merely inclose the wall, protect the blooms from the frost, and further the growth of the fruits. Such cases placed against

flued walls are all that is needful to insure the safety of the fruit. In the case of unheated walls something more is needed—the glass must either be covered or some means of warming the atmosphere provided.

One of the simplest peach cases that contains the merits of a fixed or movable permanent wooden and glass coping as well is that shown in Fig. 53. Common frame lights may readily be used for this purpose and be fixed to a few splines of wood, proceeding from the coping to the

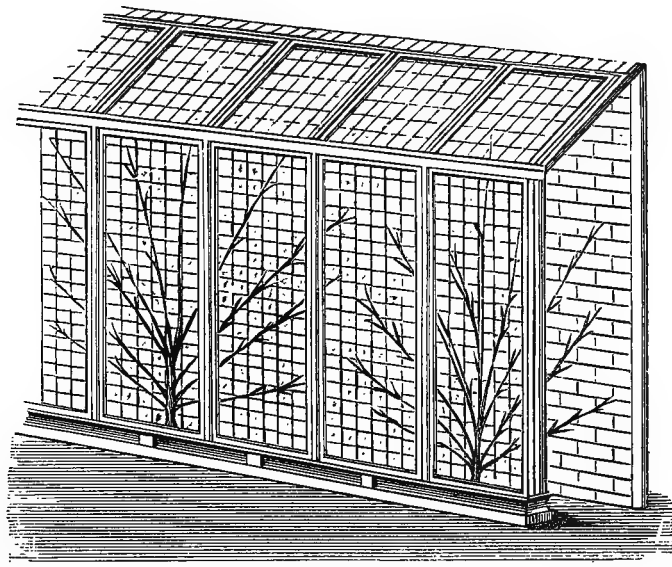

FIG. 53.

ground, or a stud raised 9in. or a foot above it. The lights may be screwed down to these, and a movable board used to fill in the bottom space at night, to be removed by day for ventilation. The Messrs. Messenger and other horticultural builders have improved this rough and cheap case by raising a plinth of brick, slate, or wood at the bottom, and either providing for the sliding of the lights for ventilation, or the raising of a 6in. board between the lights, leaving a clear space from base to summit of the wall, or its movement to either side as required, so as to open on the opposite side to the wind. Such cases answer remarkably well, and are, of course, rather more easily

worked as well as more ornamental than those formed with spare glass lights. They generally partake more of the character of glass walls than glass cases, the lights being almost vertical. Hence they inclose but little air, and this is one of their greatest weaknesses. All narrow glass cases heat, and consequently also cool, with great rapidity, thus requiring liberal and prompt ventilation and the covering of the glass, to render them efficient, otherwise the glass draws the flowers forward into abnormal tenderness by day, and exposes them to so much cold at night that the glass proves of but doubtful advantage. It is, in fact, highly problematical whether the extra liability to injury induced by day forcing is balanced by the extra protection afforded by a mere glass screen at night.

II.—Orchard Houses.

THE majority of these are span-roofed (Fig. 54); but lean-to orchard houses also abound. It is obvious that the term is applied rather to form of trees and style of culture than to any special variety of glass house.

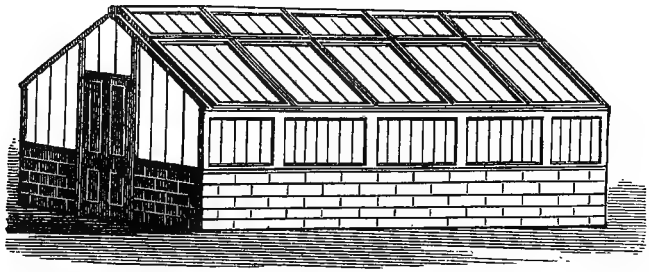

FIG. 54.

The term is also used by many cultivators to designate houses that are either unheated, or to a less extent than peach houses. Most of these distinctions are, however, arbitrary, and as orchard houses increase and multiply, they will probably lose their present significance, for there seems no good reason why a peach orchard under glass—that is, an orchard house—should not be forced or treated exactly like other peach houses. Orchard houses also differ broadly from glass cases, inasmuch as they are seldom erected against walls already furnished with peach trees, but rather filled with trees of a more free style of growth. However, there are also orchard houses filled with cordons and trees trained on trellises.

Still, they are more generally furnished with standard, pyramid, or bush trees in pots or planted out.

The chief merit of orchard houses as opposed to peach cases is their size, varying in width from 10ft. to 20ft., 30ft., or more, and in height from 6ft. to 25ft. It is obvious that they inclose a great mass of air, and, consequently, they are much longer in being cooled than smaller houses. Hence trees in unheated orchard houses not seldom escape injury from frosts that prove quite fatal to trees in glass cases, though the latter have a large reserve of stored up heat in the brick wall, which the other has not. Trees may also be kept much later in orchard houses than in glass cases, being generally span-roofed, with ample ventilation in the apex, and the whole of each side frequently made to open so as to create a through draught. The hottest spring sunshine has comparatively little influence in heating the air of orchard houses or exciting the trees. All these retarding conditions are entirely reversed in glass cases. With the utmost possible ventilation, the close proximity of the glass to the wall seems to endow the solar rays with greater force and new power, and the trees rush the faster into bloom in consequence. There is often a difference of a month between the flowering of peaches in glass cases and in orchard houses, and hence the chief reason why a crop may often be safe in the latter after it is cruelly wrecked in the former. In fact, orchard houses are just as useful in retarding crops of peaches as in rendering them safe, or fostering them by a superior climate. Neither is this retardation by any means confined to the flowering season. Peaches and nectarines may be kept much cooler, and, consequently, later, in orchard houses than on brick walls. With sufficient means of ventilation, the later sorts of peaches and nectarines may readily be gathered right up to November from orchard houses.

Of course, too, such structures may be heated to any desired extent; and it is safer to have some means of heating all orchard houses, though for late fruit it would seldom be needful to use fire heat. Peaches do well in a low temperature. The flowers set freely, unless actually frozen, in a temperature of 45deg.; 50deg. should not be exceeded until they are set. And as regards ventilation, though means of giving air on the crown of the ridge or highest part of the roof, and also along each side, should always be provided, yet they need not be used unless when required. Only those ventilators on the sheltered side should be opened during cold winds; and, of course, by early closing and a judicious use of fire heat the trees in orchard houses may be brought on as fast as in others, though, as a rule, they are generally so managed as to come in either between the fruit in the peach house and the open walls, or after the latter.

III.—Peach Houses.

THESE are generally devoted to the culture of the peach and nectarine grown on trellises. Of course, they may be heated or unheated; span, half, or quarter span, ridge and furrow, curvilinear (see Fig. 55) or lean-to roofed (Fig. 56). Generally, however, they are lean-to houses, varying in width from 7ft. to 12ft., in height of back wall from 8ft. to 14ft., and in front from the ground line to 5ft. Part of the front wall is generally converted into a glass light, from 1ft. to 3ft. in height, which is used as

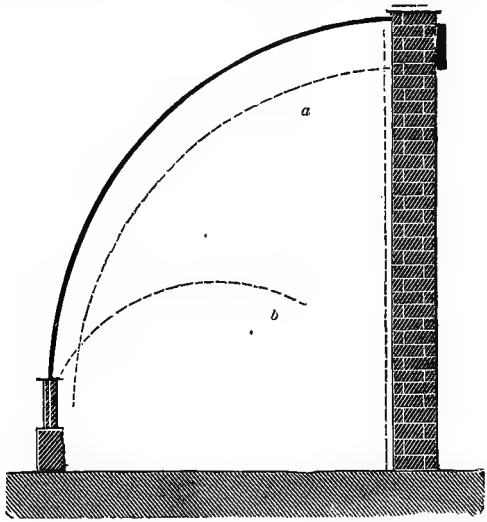

FIG. 55.

a ventilator. Top ventilation is either in the back wall by means of sliding lights, or more generally of a glass ventilator of from 9in. to 30in. wide, running the whole length of the house, and lifted at once by means of a simple lever or crank. The trees are either trained on trellises in front, on the back wall behind, or along the roof itself. (See Figs. 55 or 56.) The pitch of the roof and the size of the peach house varies widely, according to the season when the peaches are required. For early peaches, rather narrow houses, with steep roofs, are preferred—say, 9ft. wide and 10ft. high at the back. For later or successional

peaches, houses 12ft. wide and 12ft. or 14ft. high are more suitable. Early peaches, flowering in November and December, require all the scanty rays of the sun to enable them to set freely. Less importance is, however, now placed upon the mere form of roof than used to be the case; still, there can be no doubt the form of the house may prove either a help or a hindrance to early peach culture. More direct sunlight and heat will pass through a roof at an angle of 45deg. than through one of 30deg. Consequently, the former is the best for an early peach house; the latter the more suitable for a late one. The wider the house, and the less the difference between the height of the front and back wall, the

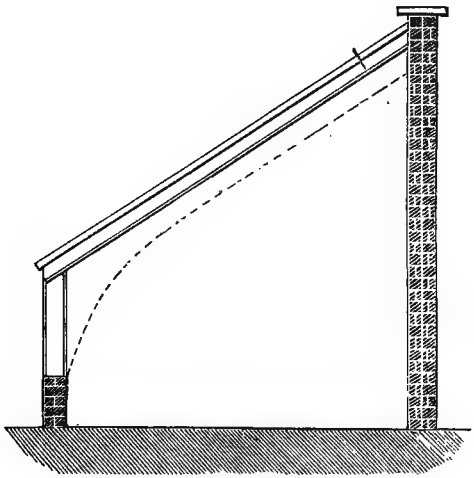

FIG. 56.

flatter the roof; the narrower and greater the difference between the two walls, the sharper the angle of elevation. This is well shown in the glass peach case (Fig. 52).

The wider houses also afford more space, and are less liable to extremes of temperature. The latter is more dangerous in peach culture than with almost any other fruit. The flowers often fall in showers after any sudden and severe elevation of temperature. The embryo fruit are almost equally liable to wither up or shrivel from the same cause; while during the stoning period any excess of heat favours the casting of the fruit in a very wholesale manner. Houses of considerable area, with ample ventilation, are the surest antidotes against extremes of heat and cold.

The curvilinear peach house is an excellent form for early peach houses, or in unfavourable climates or localities. It admits more and clearer light than almost any other. The trees may be trained according to the curve of the roof, or, rather, increasing the distance from the roof as it ascends, as shown in (*a*, Fig. 55), or the trees may be planted on the back wall, and also trained over a curved trellis, as shown, extending from the front of the house to the path at back (*b*, Fig. 55). The light is so intense in these houses that the trees do well on the low trellis, which leaves almost the whole of the back walls available for another set of trees. Of course, where the roof trellis is used, as shown by the dotted line under the roof of Fig. 56, no trees are planted on the back wall, for the whole area of the glass is already occupied.

IV.—Trellises.

THE general cultivation of the peach under glass differs but little from that in the open air. The subject, however, naturally divides itself into two parts, that may be designated the permanent and the portable, that is, the trees may be either planted out or grown in pots or tubs. The more common method is to plant out the trees near the front of the house, and train them upon a roof trellis, about 18in. or 2ft. from the glass. This trellis is often carried up the whole length of the roof. (See Fig. 56.) At other times it is carried up about two-thirds of the length of rafters. This mode of cutting off the roof trellis is considered the most provident of space. Assuredly it improves the appearance of the houses. A roof trellis stretching from base to summit of a wide peach house is a noble sight, and peaches colour and flavour to more perfection on such trellises than grown in any other way. But the bare back walls have a bald and barren look. By cutting off part of the roof trellis the back wall may also be clothed with trees. Riders, with clear stems of 3ft. to 6ft. high, according to the height of the wall and the length of the roof trellis, may be used for this purpose. Such trees often do exceedingly well, as they have the free run of the borders lying all in front of their roots.

The trees on the trellis, unless allowed to run outside, which is often done by building the peach house on arches, are rather placed at a disadvantage in this matter, for it is found that roots do not travel so freely to the north as to the south. The sun seems to draw the roots as much or more as the tops of plants. To meet this objection in early peach houses, in which the roots are generally confined to the inside, half standards are frequently employed. These are planted about the centre of the border and trellis, and spread over the latter in all directions as

stellate fans. The general mode of training peaches on roof or other trellises is the common fan or Seymour's, or other modifications of it. Where the trellis covers the whole roof two sets of trees are generally employed at first—a set of dwarfs to clothe the bottom and furnish the entire trellis ultimately, and of riders to furnish the top for a time. The dwarfs may also be planted at first as thick again as the permanent trees. The trees soon come into bearing, and a crop or two pays for them many times over. As glass is costly, and immediate returns are generally desiderated, peach houses should be furnished with trained trees of considerable size. These, if carefully moved early in November, will carry a crop the first year, and speedily furnish the trellises and walls.

As to the distance apart of the permanent trees, that must be considerably influenced by the size of the house, height of the back walls, and other matters. From six to ten or twelve feet apart are convenient distances, planting supernumeraries, however, between, to fruit at once, and be removed as soon as the others require the entire space. Those who prefer cordons may of course furnish their trellises and back walls with those instead of fan-shaped trees. Narrow peach cases are well adapted for short cordons on the roof in front, and longer ones, almost from base to summit, on the back walls. Such houses afford good facilities for free and ready access to these trees to perform the necessary pinchings, stoppings, &c. Peach cordons at 18in. or 2ft. apart speedily furnish a house and prove profitable.

Peach houses may also be furnished with what are called table trellises —that is, low flat or curved frames of iron or wood placed near to or at several feet from the floor. (See *b*, Fig. 55.) If the glass and roof be clear the peaches suffer but little in colour or flavour on that account. The chief merit of this form of trellis is that it leaves almost the whole of the back wall available for another set of trees. This, when covered with dwarf or half-standard fan-trained trees, in robust health, perfect forms, and full of fruit, has a rich effect. Rather more fruit space is gained in this way, and the effect is pleasing, as the whole fruit is more readily seen on its best side than is possible on roof trellises.

Curved trellises are also frequently used for the training of the peach and nectarine under glass. These please the eye at the partial expense of the trees and their fruit. Rather flat segments of wide circles are those generally employed. The leaves and fruit at the back parts of such trellises are, however, thus subjected to the oblique rays of the sun, which is a serious drawback to this form of trellis. A quadrant-shaped trellis may, however, be so placed as to look remarkably well, and also secure most of the solar and solid advantages of a trellis running in the

same plane as the roof, which, as already remarked, is doubtless one of the very best of all forms for the trees and the fruit.

It may be well, however, to note that in this age of superior glass and larger squares it is less necessary to thrust the trees so close to the glass as in the olden times of small squares and green, dull glass. Eighteen inches has been given as a good medium distance. But on roofs glazed with large squares this distance might often be doubled. And on houses built with a sharp pitch or on the curve, the trellis might be a foot or more further from the glass at the top than at the bottom of the house. The heat strikes such houses with cumulative force as the roof ascends, and it is no uncommon thing to find the tops of peach trees on long roofs eaten up with red spider, fostered by the excess of heat on their crowns.

Yet another plan of training affords more surface than any other, and proves very successful in practice. Vertical trellises are brought down from each, or every alternate rafter to the ground, or to an ornamental iron rod within a foot or so of the soil. These trellises may finish in an arch over the pathway at the back. The space over the arch and between it and the rafter may be filled in with trellis work if the peach trees are to be trained over the arch. These trees, however, may only be trained on the vertical trellis, reaching from the path to the front lights. These arrangements convert the house into a series of peach stalls. A tree may also be planted on the back wall, in the centre of each stall. The whole of each tree on the vertical trellises is thus favoured with the full light and heat of the sun throughout some portion of the day, and those on the back wall get more light and heat. The sun also hits the fruit on both sides on the cross trellises, and the results in colour and flavour are most satisfactory. The effect of houses arranged in this way is greatly enhanced if a grape vine is carried over each arch and kept closely spurred. In houses of considerable length this becomes highly ornamental, and the clustering grapes, while beautiful in themselves, also heighten by contrast the beauty and brilliancy of rosy or pale cream coloured peaches and nectarines. But any that might object to grape vines, even as garniture to peaches, can readily train a peach branch over the arch, and fill in right up to the back wall with bearing wood.

V.—Standards, Pyramids, and Bushes.

One of the most striking and pleasing revolutions in modern horticulture is the introduction of more natural and free modes of treating such trees as the peach and nectarine. As the primary use of glass is to create and sustain artificial atmospheres at will, it follows that by its

aid the hard, fast, and narrow lines of training needful to command a maximum intensity of solar influences in the open air may be dispensed with under glass. It is, therefore, no longer needful to skeletonise a peach tree over a trellis or wall in order to ripen its fruit. On the contrary, they may be grown under glass as trees of any desired form and size, according to the capacity of the house. In a word, our ability to

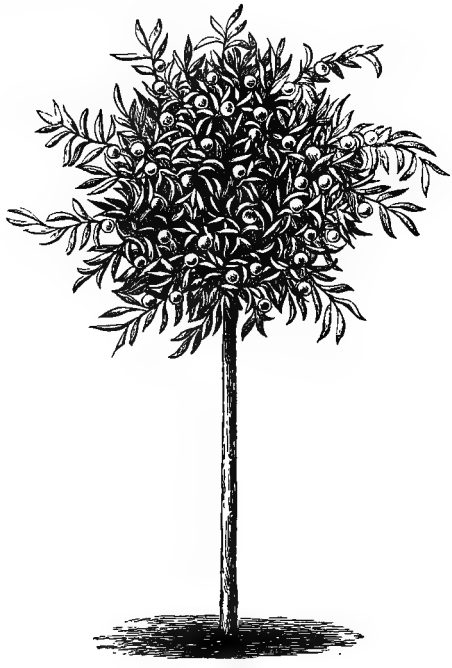

Fig. 57.

create and sustain artificial climates at will enables us to grow natural peach trees in England if so disposed.

The natural desire of cultivators, however, to crowd as much bearing wood as possible into a limited area, has practically restricted peach trees under glass to three general types or forms: these are standards, pyramids, bushes. (See Figs. 57, 58, 59.) Of course there are endless modifications of each of these forms, but the general types are, as a matter of fact and experience, preserved in the so-called orchard houses,

a phrase used to distinguish houses furnished with such trees from peach houses furnished with trees on trellises. The standard (Fig. 57) is perhaps the best form. It suits the graceful habit of the peach admirably. Of course it may be of any size or height desired. Trees, however, with a height of stem ranging from 3ft. to 5ft., and a diameter of from 4ft. to 8ft., are perhaps to be preferred. It is obvious that any sized houses may be well and profitably furnished with standards. In lean-tos, for

Fig. 58.

example, the highest standards would be placed at the back, coming down to the lowest in front. In lofty span-roofed houses again, which are generally arranged with a bed in the middle, a path on either side, and a border between the path and the side lights, the tallest standards would be placed in the centre, descending in gradation to lower ones against the path in the centre beds, the lowest of all being reserved for the side borders. Such an arrangement is not only the best culturally, but artistically, and few horticultural sights are more rich and pleasing than

an orchard house well filled with standard peach trees thus trained and planted. With skilful pruning and training, the habit of the peach and nectarine facilitates their conversion into the most symmetrical standards, which are clothed with more grace and richer beauty as they are forced to weep beneath their luxurious burdens of fruit.

The pyramid (Fig. 58) is perhaps the next best form for the peach and nectarine planted out under glass. Everyone is now familiar with the conical or pyramidal form, as it has become the most popular for apples, pears, and plums in the open air. The peach can hardly be said to take

Fig. 59.

kindly to this form, though once it is moulded into it it may thrive and fruit well for years afterwards. By using pyramids of different heights, and planting them quincunx fashion, a great many trees may also be packed into a given space without their greatly overshadowing or interfering with each other. A centre line of tall trees, supported by a row of more dwarf ones on either side, is a very good arrangement, and on wide central borders five rows may be used, planted at distances of 4ft.,

5ft., 6ft., or 8ft. apart, according to their size. A single row or two rows may also be arranged on the side borders.

Bush trees (Fig. 59) are seldom used to furnish an entire house, though the form is well adapted for low houses. But bushes are more generally employed to fringe the sides of walks or borders, and to fill up the lower parts of houses where the taller standards or pyramids cannot be placed. The great advantage of this mixed style of furnishing is that it enables more fruit to be grown in a given area than by the use of any one style of tree only. Perhaps the most profitable method of furnishing a permanent orchard house is to use standards for the middle and chief parts of the centre and side borders flanked all the way round with bush trees or cordons.

VI.—Routine Treatment.

THE soil already described for peaches in the open air is also the best for trees inside. The borders should be composed of sound loam, and if poor it may be enriched with an admixture of crushed bones. The great merit of these as fertilisers is that they enrich for a long period, and do not break down or injure the texture of the soil. The calcareous matter of the bones is also most useful to the peach. The depth of borders for peaches under glass should average 30in. or 3ft., its width the same as the house. The trees under glass being deprived of natural dews and rains, it is almost impossible to over-syringe peaches and nectarines from February till the end of September. Two heavy sprinklings a day tend to keep down all insects as well as to strengthen and refresh the trees. Of course, early in the season and during dull weather these heavy shower baths will be dispensed with.

Glass walls or cases often suffer severely and become a prey to red spider and thrip for lack of attention to these shower baths twice a day.

The roots also need much more water under glass. Taking the annual average rainfall at 30in., it requires a good many artificial waterings to reach to that quantity; and peach roots under glass are also, as a rule, subjected to more severe drying conditions than those in the open air. The sharp currents of air incident to thorough ventilation evaporate the moisture rapidly out of the ground, and as the drainage of peach borders under glass, whether outside or in, should be perfect, there is little danger of over-watering them. In all artificial waterings it is always needful to bear in mind the great difference in quantity required for outside peach house borders and those wholly inside. The latter, as a

rule, require double or three times the quantity that would suffice for the former; disbudding and the thinning of the fruit may also be set about earlier and carried to greater lengths under glass than outside. In the open air these operations are often, perforce, delayed, for fear of the climate. The latter being under our control inside, the well-being and strength of the trees may be more studied in the early and prompt thinning of the shoots and the fruit.

Glass, too, affords, greater facilities for dealing with insects, and it ought, and generally does, prevent disease. Aphides can be at once destroyed by a strong dose of tobacco smoke, red spiders kept down by sulphur fumes and sprinklings, and mildew and other evils should scarcely show themselves under the genial influences of glass. The young wood ought to be kept rather thin and carefully trained as it grows. These brief hints may suffice here, as it is purposed to enter more fully into cultural matters in the following chapter on the pot culture and forcing of the peach.

VII.—Cultivation in Pots.

STANDARDS, pyramids, bushes are the best for pot culture. Few fruits do so well in pots as peaches. Trees of considerable size, bearing from one to six dozen fruits, may readily be grown in pots. 12in., 15in., and 18in. pots are those best suited for peaches and nectarines. Various modes of cultivation are practised. Some growers prefer rather small pots, and allow the roots to run through into rich composts. Many of the roots thus feed outside the pots during the growing and fruiting stages. In the autumn or early winter the trees are removed, and all roots that have run through are thus destroyed. This system sometimes answers exceedingly well. Still, it is a rude, barbarous mode of culture, and full of risks. Not seldom almost the whole of the best roots are destroyed. Others adopt quite a different system. They place the pots on a shelf or stage, or a base of concrete or slate, so as to prevent the possibility of the roots passing through the bottom of the pots. They then entice the roots up above the rims of the pots by top dressing with rich compost or manure, supporting the latter with a band of turfy loam or a sheet of zinc about 4in. or 6in. deep. This plan is preferable to the other, as the whole of the roots are preserved intact, and the best of them, those nearest the surface, are provided with the most and the richest food. Still, neither system is pot culture pure and simple, inasmuch as the one feeds the roots beneath and the other above the pots. Neither is either plan needful, for capital peaches

may be grown in pots of the sizes specified without such adventitious aids either above or below. Good rich soil should be used for peaches in pots and under glass, such as that already recommended. Good holding loam from an old pasture, mellowed for six months or so, and mixed with a sixth part of well-rotted manure, a few inch bones, and some charred refuse, is the best soil for the pot culture of the peach. Drain with smashed oyster shells or broken bones, covering the bottom of the pots with an inch and a half or two inches of such matters. Then use some of the roughest of the loam, making all firm as the operation of potting proceeds. It is also important to distribute the roots pretty equally through the mass of soil, and to pot the plants firmly, watering them home immediately afterwards.

The best season for potting is from the middle of October to the end of November. The roots are in a state of abnormal activity, and soon recover from the disturbance and check incident to removal, and quickly re-establish themselves in their new quarters. The trees should be placed in the orchard house or other frost-proof quarters immediately after potting, or the pots may be plunged overhead and mulched in the open air. In any case, it is needful to take precautions against the roots being frozen through the sides of the pots. There is also great risk in plunging the plants in the open air. The novelty of peaches in new positions often attracts birds, which peck off the fruit buds with wonderful rapidity. For these and other reasons it is better to winter pot peaches and nectarines under glass. While taking care to exclude severe frosts from the top, the roots must never be suffered to become too dry. Dryness at the roots in winter is one of the chief causes of bud dropping in the spring and the fruit refusing to swell, or falling off at a later period; and as there is little danger of an excess of water in well-drained pots, several good soakings may be given to the roots during the winter months. Unless during frosts or cold drying winds, the orchard house, however, should be kept as cool as possible—the ventilators standing open night and day. In spring and summer the treatment must correspond with that applied to peaches planted out under glass or in the open air. Early disbudding, careful thinning of the fruit, the selection of the best placed and most suitable wood for succeeding that in fruit, the immediate destruction of all insects, the guarding of the trees from sudden and severe changes of temperature, especially through all their early stages of growth, overhead sprinkling, and copious root watering are the chief points to insure success.

In addition to these earlier requirements, a more liberal regimen should be adopted during the last swelling and ripening of the peach.

As soon as peaches are stoned they will bear more liberal and forcing treatment. Up to the completion of that critical process the hold of the fruit on the branch seems somewhat slender and precarious; but afterwards the fruit has greater security of tenure, and is less easily forced or flushed off. Hence it may be fed with manure water, such as house sewage or guano broth, made by dissolving 2oz. to the gallon. Nothing suits peaches in pots better than this. All superfluous wood and leaves should also be reduced or removed; and if the tree seems overburdened with fruit, it is better to remove some even thus late than have the entire produce reduced in size and lowered in quality through overcropping. As much air as possible must also be given consistent with a temperature of 65deg.—70deg. about the highest that peaches should be subjected to. A drier atmosphere should also be maintained during the finishing period, and less water given at the roots; no manure water must be given within three weeks of the finishing of the fruit.

In cultivating a general collection of peaches and nectarines in pots there will often be an interval of six weeks or two months even between the time of gathering the different varieties. And one of the greatest advantages of growing peaches in pots is that more trees and a greater variety can be grown in less space than by any other system. The trees also being all portable, it is not necessary to introduce them into heat or under glass all at one and the same time. The earlier trees can be placed in the open air as soon as their fruit is gathered. This treatment is best for the trees removed, and also affords additional facilities for the more perfect ripening of the wood and fruit of those left. The thinner the orchard or other house can be made in the autumn the more light and direct sunshine the trees left enjoy. The temperature may also be raised for late varieties, to the great improvement at times of their flavour. Trees may also be brought from the shady to the sunny side of the house, or taken from cold orchard houses into warmer vineries or other houses to finish.

The advantages of the portability of peach and other fruit trees under this system are almost endless. It affords every facility for the forcing of some trees, the retarding of others, and the bringing in of the main crop with the least possible expenditure of skill, labour, or heat, between these two extremes. Then a few trees or many may be had in, at any given time. Half a dozen peaches in pots may be forced or kept back, or grown slowly in any glass house devoted in the main to other purposes. There is no reason, for example, why a few such trees should not be grown in a common greenhouse or conservatory, vinery, peach house, or other glass house. How easy, also, to winter a few of the late

peaches in pots in a north pit or house, and to introduce them into a common orchard house late in the season, and thus extend the peach season into November.

The trees may be shifted into larger pots during the winter if they require it; if they do not, as much as possible of the exhausted soil should be removed from the sides of the ball, the drainage examined and renewed if necessary, and fresh soil of the same quality as before employed to make good the deficiency; the new soil must be made very firm, so as to unite with the old. The trees should also be pruned into shape and dressed as already described, if they have been infested with aphides or other insects. If, however, the wood has been carefully chosen and stopped during the summer, peach trees in pots need but little winter pruning.

VIII.—Forcing.

THE peach cannot be hurried with safety during its earlier stages. It resents a higher temperature than 55deg. until, its blossom buds are set. A temperature 10deg. less than this, or 45deg., is perhaps that best adapted for the free setting of the peach. The penalty paid for any excess of warmth during the earlier stages of forcing is the shedding of the blossom and the starting of the wood buds in advance of the fruit blossoms. Possibly, these last symptoms explain the falling of the blossom. It seems almost as if the first set of buds that attract the sap kept it solely for themselves for a time. It is certain that when the blossoms open and set freely the wood buds seem to stand still until this work is well-nigh completed; whereas, when the latter start first, the blossom buds fall in showers. It also requires more heat to start the wood buds than the flower buds, hence the vital importance of a low temperature till the blossoms of peaches and nectarines are set.

This necessity is a great trial to the ardent forcer, but it is surely better to lose time than to lose a crop, and it is wise to begin with the full conviction that six months are needed to carry peaches in safety from the start to the finish. It cannot be done in less time without the certain risk of failure. Of course, the later in the season peaches are forced the less the time needful to ripen them. Hence, peaches started in January may be ripened, perhaps, by the end of June, while those started on the first of November can hardly be ripe till the first of May. For not only is the peach impatient of heat during its first stages of growth, but afterwards. Right up to the stoning period any artificial heat beyond 55deg. or 60deg. is dangerous. All cultivators have learned

to distinguish between natural and artificial heat; peaches and all other fruits and plants will bear more of the former than the latter, not only with impunity, but at times with benefit. The light accompanying solar heat possibly accounts for most of the difference. But there is also another reason: generally, any sensible rise of temperature from the sun is accompanied by ventilation; this sets the whole air of the house in motion, which has possibly an invigorating effect on the blooms and young fruit; whereas a high night temperature is associated with a still atmosphere, hence, possibly, its enervating influence on the blooms and embryo fruit of the peach. High night temperature also draws the young shoots and unduly elongates and weakens the leaves; in a word, it expends the sap in a wrong direction and to a wrong purpose, to the weakening of the vital energies of the tree and consequent loss of the crop.

During the stoning period it is needful to be cautious. The tree can hardly be said to have adopted the fruit for good until this process is completed. Stone fruits like the peach, that set ten or twenty times more fruit than they are able to bring to maturity, had need be endowed with certain natural powers of thinning. The peach possesses those powers to an alarming extent; it can throw off most of its flower buds, refuse to set or swell the major portion of its embryo fruit, and also may cast off any or all its fruits in the stoning. Any excess of heat during these processes augments its thinning powers. An artificial temperature of 60deg. should not, therefore, be exceeded until the stoning process is so far completed that, on trying to cut a fruit through with a knife, the stone is so hard as to resist its progress.

Other means may also be adopted to aid a full set and a free swelling of the fruit as well as a careful regulation of temperature. A genial atmosphere, and a free circulation of air are among the more important of these. In early forcing, too, when no bees or other insects are moving, to distribute the pollen, a gentle shaking of the trees and the direct distribution of the pollen on to the pistils with a camel's hair pencil are useful mechanical means of helping a free set of fruit. A fine gentle syringing of tepid water serves also to wash the pollen grains into the ovaries, though heavy syringing or an atmosphere so moist as to lessen the buoyancy of the pollen grains should be avoided.

After setting more moisture may be used, sprinkling overhead morning and evening, and the sprinkling of the paths and borders several times a day in bright weather favours the free swelling of the fruit. Early and judicious thinning, removing all the smallest, worst placed, and imperfectly formed fruit first, also favours and fosters the rapid advance of the fruit. A double crop should, however, be left until after the stoning,

as the tree is almost sure to exercise its own selection at this period, and reject and cast off a few of the fruit chosen by the cultivator.

Immediately the stoning is completed the thinning of the fruit should be carried out to its final extent. Nothing is gained and much lost by leaving too many; a fruit for each 9in. of area of tree or trellis is a good mean. Some prefer 5in., which is much too close; others a foot, which may be a little too wide apart, unless in the case of the larger varieties. Copious ventilation is another means of enabling forced peaches to set and hold a good crop of fruit. Anything approaching a close stuffy atmosphere is most abhorrent to peaches. The lack of fresh air in motion causes them to cast off their fruit. In early forcing, however, the opposite extreme of excessive ventilation, ending in draughts, must also be avoided; a thorough draught in February or March would often utterly ruin a crop of forced peaches. Neither is it necessary to carry ventilation to extremes in early forcing; ventilators in the back wall are the best for this purpose, and far preferable to sliding lights or ventilators that open on the roof. A very careful and sparing use of these will admit sufficient air to enable the trees to hold their fruit, and also prevent the wood and leaves from spindling into weakness.

As the crop reaches maturity more air is needful, and it is generally possible to admit air in front as well as the back of the house, and also by night as well as day. A stagnant atmosphere seems almost incompatible with the development of the highest flavour in peaches, and, if possible, it must be avoided, even in early forcing. More heat may also be safely applied to peaches during their last stages. From 65deg. to 70deg. of fire heat then becomes, for the first time in peach forcing, safe, with a rise of 10deg. by solar heat. In fact, it is only at the finish that peaches can be hard forced with safety, and even then it is better to avoid it unless the crop has to be raced against time, which is not unfrequently the case. However much the crop may be hurried through its final swelling, the fruit should be finished in a comparatively cool temperature of 60deg. to 65deg., with plenty of air. Careful root watering must be attended to right up to the ripening period. It is a mistake to suppose that dryness at the root favours high flavour, though the opposite is probably true—that an excess of water might lower flavour. But flavour is more a chemical than a mechanical process. It is less influenced by root absorption than solar transformations, though these last are probably weakened or checked by a lack of moisture at the roots. For the leaves—which flavour the fruit, of the present as well as elaborate sap, and store it away in fruit buds for next year's crop—can only be preserved in health by a continuous and sufficient supply of sap sent up from the roots. An insufficient supply not only arrests their functions but

predisposes them to disease, and renders them a ready prey to red spider and other insect pests.

The atmosphere, however, may be kept drier during the ripening of forced peaches, though it is not wise to carry this dryness to excess. The cultivator must ever bear in mind that the autumnal season brings the heaviest dews, and peaches in an arid clime are neither so luscious nor so sweet as those finished in a more genial climate.

After forcing there is nothing so good for the trees as exposing them freely to the natural atmosphere. The old-fashioned practice, therefore, of unroofing early peach houses as soon as the fruit were gathered is still, where practicable, the very best.

Peach trees in pots or tubs should be placed out of doors after forcing, to be left out till October. This perfect exposure thoroughly matures the wood, plumps up the fruit buds to the largest size, and leaves them brown as a nut and solid as a rock.

In cases where such complete exposure is impossible forced peach houses should be left open night and day, and the trees have a shower bath once or twice daily until their leaves drop. The sooner they are pruned and dressed after defoliation the better, especially if they are to be forced early the following season.

The whole of the woodwork of the forcing houses should also be thoroughly cleaned and a coat of paint given if possible. This last is one of the best antidotes to insect pests. The trees, even if clean, may also be dressed over, for prevention is infinitely preferable to cure. The most common dressing is composed of equal parts of sulphur, lime, soot, and cowdung or clay, to add to its cohesive properties, made into a thick paint, with a sort of lather of soft soap. This acts chiefly as a smother. Many add to the killing properties of the mixture strong tobacco liquor, nux vomica, hellebore, or other poisons. The best dressing, and the one recommended by the writer, after a long experience, as the most efficient deterrent against the insects and diseases of the peach, and a partial cure also for blister, is composed thus: ½lb. sulphur, ½lb. tobacco, ½lb. soft soap, ½lb. hellebore, 2 pints soot (dry and fresh), 2 pints lime (fresh quick). Boil tobacco half an hour in a gallon of water; after being strained add the other ingredients, but it is well to dissolve them in tepid water before being mixed, the soot and lime being stirred in at the last. Make the mixture to the consistency of paint by adding water, then apply it with a brush all over the trees.

The surface soil should also be removed from the borders, and if the trees have shown any signs of exhaustion 6in. or more of rich compost or a liberal dressing of manure be applied. A few thorough soakings of

manure water or sewage during the resting period of forced peaches is also a capital mode of restoring the strength of exhausted borders, as well as of destroying any fungi that may have taken partial possession of the same. All these cultural or cleansing processes accomplished, the trees will be ready for a fresh start at any time when required, though it is hardly safe or likely to prove profitable to attempt to force peaches until the end of October or the beginning of November. The middle of that month or of December is likely to prove more successful, and January is better still. Beyond that period the forcing of peaches hardly differs from the growing of them under glass.

IX.—Retarding.

This has already been referred to in regard to orchard houses. It may, however, be carried much further by the choice of cool sites for houses, and the selection of late varieties. The majority of orchard houses run east and west, thus exposing one side to the full force of the sun. If the later varieties of peaches and nectarines are placed on the north borders or sides of such houses they will of course ripen later than if they were set on the southern side. The houses may also be built to run north and south, and such houses presenting thus their sides to the east and west will prove cooler than those running east and west. But north lean-to houses may also be used for the winter and spring storing of peaches and nectarines in pots. The trees could thus be kept very late in flowering, which would retard all future processes. The experiment of planting out peaches in a house with a northern aspect has not been tried. The fruit would doubtless be rather acid. But an eastern aspect would powerfully retard the ripening of the fruit, and also finish it if of good quality. But with portable trees, to be moved out-doors at pleasure, and replaced at will in those houses most favourable to the perfect ripening of the fruit at the last, the retarding process may be best accomplished.

A good deal may also be done to lengthen the peach season by the selection of late varieties. These have been largely added to of late years by the late Mr. Rivers, of Sawbridgeworth. Among late varieties the following are among the best:

Princess of Wales, one of the noblest peaches in cultivation.

Osprey, a week or so later than the above.

Lord Palmerston.

Lady Palmerston.

Gladstone, described by Mr. Rivers as late, large, and good.

Golden Eagle, a beautiful yellow, or rather golden fleshed peach, of great size.

The well known Barrington peach is also well adapted for cool treatment, so as to come in late. And the two Admirables, the Late and Wallburton, are too well known to need further notice here.

LATE NECTARINES.

Victoria.	Pitmaston Orange.	Stanwick.
Albert Victor.	Pine Apple.	Humboldt.

X.—Varieties for Early Forcing.

MANY of those already recommended for growing out of doors are also the finest for cultivation under glass, as well as for early forcing. It would be difficult, for example, to choose three better forcing peaches than the Royal George, Noblesse, and Violette Hative; or three better nectarines than the Violette Hative, Elruge, and Balgowan. Still almost a month may be gained—a matter of great moment—by selecting the following varieties instead of these. Few of them are perhaps quite equal in general merit to the above well proved popular varieties. But a month or six weeks earlier covers a multitude of faults, though the following sorts have but few failings—the majority of them none:

PEACHES.

Early Beatrice.	Early Rivers.	Hales' Early.
Early Louise.	Rivers' Early York.	Alexander.

The latter, an American variety, hardly as yet known in this country, but said to be earlier than even the Early Beatrice; and if so, ripening in the open air early in June.

NECTARINES.

Fairchild's Early.	Hunt's Tawny.	Rivers' New White.
Lord Napier.	Advance.	Early Newington.

By the aid of these early and late varieties peaches may be gathered in the open air from June to November, and possibly, by the aid of forcing and retarding houses, from March to January, thus girdling round nine or ten months out of the twelve with peaches and nectarines.

DISEASES, INSECTS, AND ENEMIES.

UNDER favourable conditions of climate, soil, and culture, these trees are not specially subject to disease. Most of those from which they suffer are accidental rather than constitutional. It is a severe trial to the health of these and other fruit trees to be immovably fixed to the wall, and to have every part of them thus fully exposed to the extreme alternations of heat and cold without shade or shelter of any kind. The forced and perfect rigidity of trunk, branch, and twig also doubtless exaggerates, if it does not originate, many of the diseases that weaken or destroy peach trees. These conditions, however, are necessary to the successful culture of the peach in our climate. That climate is too cold for standard peaches, and the extra heat from walls is essential to success.

The most common diseases that affect peaches and nectarines in the open air are canker, gum, mildew, blister, sunstroke, root gout, fungus and suckers, jaundice or the yellows, honeydew, and super-swelling of the scion over the stock.

Peaches and nectarines are rather subject to the attacks of insects. These may be divided into two classes—those that prey upon the leaves and those that devour the fruit. Of the first class are red spider, thrip, aphides, scale, sunfly, weevils, and caterpillars. Of the latter, snails, ants, earwigs, ladybirds, woodlice, beetles, bluebottle flies, wasps, honey-bees, and hornets are the more troublesome. Mice and rats where they abound will also often attack peaches and nectarines, as will also squirrels, pheasants, partridges, fowls, birds, and even pet dogs.

I.—Canker.

LESS prevalent among peaches than apples, this disease generally reveals itself in the trunk or larger branches. First the bark becomes abnormally hard, and rough portions of it then seem to scale off or be eaten through, leaving faults or jagged portions of the stem barkless. Canker has generally been attributed to ungenial soil; the excess of water or of iron in the earth originates or intensifies this disease. The avoidance of these, and also of all soils and situations in which the peach refuses to grow freely, generally prevents canker. Little can be done to cure it. A thick paint or plaster made of clay and cowdung has been thought to arrest its progress and assist in healing the wounds. A

dressing of sweet oil seems also of some service. But these are but palliatives at the best, and in bad cases of canker the renewal of the soil and also of the trees is the only satisfactory remedy.

II.—Gum.

This is a far more common disease among peaches than canker. This disease seems confined to stone fruits. It is very prevalent among cherries, and is also very destructive among peaches and nectarines. The sap oozes out through every wound in the wood or bark, and forms into a glutinous compound or gum. Hence the name of this disease. Its causes are not very surely known. What may be called stimulating or forcing treatment is sure to produce it. The trees are too often planted in rich deep borders that have been heavily manured. They make large gross roots in consequence. They are then severely cut back to furnish the lower portion of the trees with fruit-bearing wood. The sap forwarded by these roots is thus confined to a too limited area, and the excess runs or bursts out into gum. No doubt over-feeding and excessive cutting back are also active causes of this disease. Poor or moderately rich soils generally produce trees almost free from gum. A good antidote to gum is found in summer pinching and pruning. The wounds made by these processes are small, and they are also made at a time when they heal quickly, thus preventing the direct exudation of the sap—one of the most active causes of gum. It, however, is doubtless often caused by exceptional weather and peculiarities of locality. Sudden atmospheric changes, resulting in an arrestment or quickened flow of the sap, are likely to produce gum. It also seems to cling to certain localities. Some gardens are hardly ever free from this disease; in others it is seldom seen, though the treatment and also the soil are very much alike. In bad cases the trees should be taken up and destroyed, for gum is difficult, almost impossible, to cure. Lighter cases should be carefully scraped or washed off, and the wound dressed with oil. A strip of common tracing paper or writing paper dipped in oil may be tied over the wound. This will keep out the rain, and also moderate the direct force of the sun. The latter seems to quicken the action of gum, and partial shade is so far a palliative. In purchasing and planting young trees reject any that have the slightest trace of gum, for the merest taint of this disease in the blood is apt to overspread the whole tree.

III.—Mildew.

This is probably the most destructive disease to which peaches in our climate are subject. Small and insignificant in its first appearance, if left unchecked, it turns leaves, fruits, and small twigs white, almost as milk, or totally arrests and ruins all healthy growths by the paralysing influence of parasitic fungoids. Mildew generally originates from one of the following causes: Exhaustion of vital energy from over-cropping or other reasons, or excess of cold, of water, or drought. Debility seems to invite the attacks of mildew, as it is generally on the weakest and most ill-conditioned trees on the wall that it first makes its appearance. But it is infectious, and spreads with amazing rapidity, so that if it once get a leaf hold each tree in the garden is in danger. Severe and sudden colds arrest growth, and probably produce analogous effects on peaches to exhaustion, and are very often succeeded by mildew. Stagnant water at the root is one of the most direct causes of this troublesome disease. And, on the other hand, an absolute scarcity of water is quickly succeeded by mildew. All violent derangements in healthy vital functions are doubtless succeeded by weakness, and weakness may be termed the parent of mildew. Gross size of branch is not always a sign of good health, and hence mildew may be found on vigorous peaches at times and in seasons when an excessively moist and cold state of the atmosphere favours the development and strengthening of this disease. As to remedies, Gishurst's Compound applied with the syringe, and the milder mixture of Mr. Ewing, of Norwich, are among the most potent liquid dressings. But the lime and sulphur cure—that is, equal parts of dry fine quick lime and flowers of sulphur, distributed on the leaves and all affected parts, after syringing the latter freely to make the dressing stick—is a sure and certain remedy for mildew. The moment the first white speck appears apply this specific, and repeat it now and again till not a trace of it can be found. It must, however, be borne in mind that, although this dressing of sulphur alone will cure mildew, it cannot restore the proper vital functions of badly mildewed leaves or shoots. Hence the superlative importance of applying the remedy abreast of, or even in advance of, the disease. In seasons or localities where mildew may be expected it is a safe and sound practice to apply such dressings as preventives to mildew. They do the trees little harm, and this is one of those special cases in which prevention is infinitely better than cure.

The following, which is Eugene Verdier's mode of destroying mildew

on roses, has recently appeared in the "Garden." It is not new, but is effective: "Take an iron pot or an earthen pipkin and put into it 1lb. of flowers of sulphur and the same quantity of freshly-slaked lime. Pour on the mixture six pints of water, and when well mixed place the pot on the fire and boil for ten minutes, taking care to stir all the time. Allow the resulting liquor to cool down, and when settled pour off the clear liquor into bottles, which must be kept well corked and in a dark place. For use, a pint of the solution is mixed with twelve gallons of water, which immediately becomes milk, and the trees attacked are well syringed with it. This remedy may be applied early in the morning, but preferably in the evening. The best time in the year is the spring, when the shoots are about 2in. long. The solution should be used before any signs of the malady appear. If, however, it has made its appearance, two or three syringings will be sufficient to get rid of it thoroughly. It may be used for any other plant attacked with mildew. Its efficiency is due to the compound formed by the lime and the sulphur." This is quite as useful for peaches and nectarines as for roses, and is probably the basis of most of the liquid remedies advertised and sold for the cure of mildew on plants.

IV.—Blister.

This is a most troublesome disease, chiefly, though not wholly, confined to the leaves, for it has been found on young shoots as well. It is often associated with mildew and aphides, and both have been held by some to produce, if not aggravate, this curious and most injurious disease. It may be said to utterly destroy the vital function of every leaf which it affects to any serious extent. The mid rib and main veins of the leaves become swollen and distorted, like a limb affected by gout, and a part or whole of the tissue and substance of the leaf is converted into irregular wart-like masses of great thickness and considerable brittleness. The malformation is most peculiar, and during its process the leaf often turns and rolls itself into the most singular and fantastic forms. The function of the blistered leaf is utterly destroyed. There can be little doubt that the cause of blistering is sudden and severe cold after growth has fairly begun and is proceeding with considerable vigour. And just as frost and fire have analogous effects on our own flesh, so are cold and also heat held to blister peach leaves in this way. As this blistering mostly follows on the heels of spring frosts, it can hardly be doubted that cold is the cause. Some cultivators, however, do doubt; and if, as they contend, blistering can be prevented by

a winter dressing—of which nux vomica, tobacco juice, sulphur, and soap are the chief ingredients—this goes far to justify their opinion; one, however, which it must be added, I cannot endorse from experience. The best preventive to blistering is careful spring protection by some of the means described in a previous chapter. Cure there is none. The leaves should be picked off and burned, to make sure of destroying the germs of mildew and nests of aphides that are found in the curled and twisted leaves, and the trees be encouraged to make fresh leaves by overhead sprinklings, top dressings, &c. Mildew is very apt to accompany or follow blister or curl; therefore, it may be wise to top dress with sulphur as soon as the blistered leaves are picked off.

V.—Sunstroke.

This is quite a different disease from blister. It seldom affects the leaves at all, though they are occasionally burnt into white blotches or patches on hot south walls when the sun bursts forth suddenly after a few large drops of rain that may remain whole on the leaves. This is not what is here meant by sunstroke, but irregular burns on the young shoots, small and main branches, and even the trunks of peach trees on walls. This often utterly ruins trees, and not seldom proves a serious drawback to the preservation of their symmetry and beauty. The best means of preventing sunstroke is to keep the trees so fully furnished with young wood and leaves as that they shade most of the branches. It is unnatural to expose bare boughs to the sun without shade of overhanging twigs or leaves. The heat is also greater on a wall than the peach is subjected to in its native climate. Young shoots may often be tied over bare branches for the express purpose of shielding them against sunstroke. The boles of peach and other wall trees are cruelly treated in this matter. As well send a man to stand in the sun all day without his hat and expect him to thrive under it as back a plum stock with a peach mounted on its head against a south wall, to be half-baked all day, and not suffer from it. Long tiles are sometimes set up against the boles of such trees to keep them cool. The worst of these is that the tops of the tiles, which get excessively hot, rest against the main stem of the trees and burn a deep line all round it, which is worse than an ordinary case of sunstroke. The best possible protectors for the boles of trees are long straw sheaths, similar, but longer and wider, to those used for champagne and spirit bottles. Next to these a neat hay-band, or roll or two of common mat, are among

the simplest and best means of protecting the boles of peach trees from sunstroke.

VI.—Root Gout.

This is a peculiar disease, and is rather common in many districts. The roots, instead of being smooth and even, tapering regularly from their thickest to their smallest extremities, are studded with a number of irregular developments in the form of warty-like knots and swollen rings associated with these protuberances; these are often rusty or cankered-looking spots of a reddish colour. Such roots are also brittle, and as unlike as can be to ordinary healthy roots. These swellings not seldom produce clusters of adventitous buds, that send up or out crops of suckers. Hence this species of root swelling or gout under ground mostly has its counterpart in a crop of suckers above ground.

This state of root is not seldom caused or aggravated by the careless digging, cropping, and manuring of the borders. Ruptured roots run into this distorted state, and rank manures seem to blister the bark of the root and lead to these swellings and distortions. Where, however, this state of root is found apart from these causes, probably the soil will be found unsuitable. These trees should be taken up, and the worst of the roots carefully dressed off and replanted in fresh soil; or, if the trees are very bad, it will be wiser to destroy them, remove the soil bodily, replace with different and better, and replant with maiden trees.

VII.—Root Fungus.

This is a very troublesome disease. The mycelium of some fungus, not always the same, gets introduced into the border with leaf mould or manure, and also sometimes with the loam, and it fastens upon, overruns, weakens, or kills the whole of the roots. No doubt, too, this fungus is often bred, as it were, in the border by excessive dryness. These myceliums have such a strong affinity for peach roots and prove so destructive to the trees, that no leaf mould of any sort and no manure should be used in the composition of the borders. Drought, the great originating cause of such developments, should also be carefully guarded against. The best and only remedy for this root fungus is flooding out. A succession of liberal floodings will destroy it, and

if these fail, the trees should be destroyed and the soil wholly moved. Where the drainage is good and water plentiful, submerging the borders for twenty-four hours would be likely to prove an effectual cure.

VIII.—Jaundice, or the Yellows.

This is not very common, though a mild form of the disease is often met with. All abnormal paleness of colour in peach leaves should be viewed with suspicion, and when these show the slightest shade of yellow it reveals a very bad state of health. Stagnant water, the burying too deeply the collar of the plant in the ground, and slow starvation, from over-cropping or poverty of soil, are apt to engender this disease. The use of unsuitable stocks is also said to favour the yellows. This is probable enough; but how it came to be believed that working the peach on peach stocks was a chief cause of this singular disease is more difficult to understand. Assuredly seedling peaches are generally very vigorous and as far as possible from developing this disease. Possibly our soil in the open air may prove in the spring too cold for the roots of the peach, and that, on the whole, the almond and plum suit it better.

IX.—Honeydew.

This is considered by some writers a distinct disease, and not a product of aphides. This is more than doubtful. It is not very common on the peach in its worst form, as seen so often on the beech. It is a sweet excretion proceeding from the leaves, and no doubt involves a considerable waste of sap, as well as derangement of function. It may possibly arise from more sap being forwarded by the roots than can be elaborated by the leaves, and the excess is thickened into a sort of syrup, and passed through the pores of the leaf, which it covers with a pure glutinous fluid. As, however, I have never found honeydew on the peach disassociated from aphides, its extirpation may be treated of under aphides. Washing off, by the use of the garden engine, is the best remedy.

X.—Super-swelling of the Scion over the Stocks.

This is, perhaps, more of a malformation than a disease, though no doubt it has an injurious effect on the health, and not seldom shortens the

life of the tree. It is wonderfully common among peaches and nectarines, and prevails to such an extent that it is rare to find the scion and stocks of the same size. This is a matter deserving the earnest attention of nurserymen. The stocks and scion of the peach ought to be better matched. The excessive growth of the scion may, and does, favour earlier fertility, and also probably more fruit; but the disparity ultimately tells against the health and duration of the tree. The gnarled lump formed over the stocks is the favourite haunt of canker, and forms a capital mark for sunstroke. As already stated in our chapter on propagation, different plums are used for the peach, the most common being, perhaps, the Mussel and white pear plum. Neither of these, as a rule, keep pace with the peach. The St. Julien and Myrobolan are also recommended. Double worked plum stocks for peaches were also probably used before double worked pears were thought of, and possibly the best stock to keep pace with the peach might be found either in the white Magnum Bonum or the Mussel, worked with the Magnum Bonum, the peach to crown the double worked stocks. The mode of protecting the bole of the stock recommended in this chapter also facilitates its growth, and would bring it into closer harmony with the size of the scion. Neither does there seem any valid reason why the stocks, especially of tall rider peaches, should not be permitted to develop a few shoots on their own account. These would clothe the stem, assist in developing more and stronger roots, and possibly enable the stock to make sufficient progress to keep pace and form a good match with the growth of the scion, and thus obviate most of the deformities and other evils of the super-growths of the scions.

XI.—Thrip.

THIS is generally the result of drought or of careless treatment. The best remedy for it is frequent syringings with strong tobacco water. This kills the thrip, and should, as soon as it has effected its purpose, be thoroughly washed off with frequent syringings with clean water. Sewage of moderate strength, applied at a temperature of 130deg., is also a good cure for thrip. But it should be taken in time, or it is difficult to eradicate, as the thrip generally feed on the under side of the leaves.

XII.—Red Spider.

THIS is far more common than thrip; in fact, it is perhaps the the worst insect that infests the peach. It punctures and almost

destroys the functions of the leaves. Any excess of heat or drought induces red spider. Exhaustion through poverty of soil, over-cropping, &c., is equally favourable to its development and increase. A free use of the garden engine on the trees, and an unlimited supply of water at the roots before the trees show any signs of distress, are the surest means of preventing red spider. Sulphur is the only certain cure. This should be dusted over the leaves frequently the moment the spider or minute red spots appear. It is difficult to destroy after it gets a firm hold, and the leaves are almost useless after a severe attack of spider, hence the great importance of checking this troublesome pest early—that is, as soon as it appears, or, better still, of preventing it altogether, by the free use of water. Were the trees washed overhead daily with the garden engine in dry weather, as recommended in the chapter on general culture, red spider would seldom or never put in an appearance.

XIII.—Aphides.

These seem to have an especial liking for the tender leaves of peaches. The other insect pests here named are either created or strengthened by heat, but the aphides seem often to come with the cold east wind. Hardly have the leaves grown to half their size in the spring than they are seized by aphides, and rolled up and round into a weather-proof home for them, in which they increase and multiply with such amazing rapidity that they speedily eat up their dwellings, and issue forth in search of new and larger quarters. Nothing works so much mischief as these aphides, or green fly, on peaches and nectarines in the early spring. They are bad enough at any season, but as the leaves get older and become harder and larger, the fly cannot injure them so much nor consume them so fast; but in the spring the young leaves seem to shrink from their touch, and twist themselves into all kinds of contortions, which renders them useless to the tree, as they can no longer discharge any of the vital functions of proper leaves. There is no better nor swifter remedy for these pests than tobacco, applied of killing strength through the garden engine or syringe. The most economical way of using the liquor is to stand pretty close to the wall and apply it in a slanting direction against the trees. When the end of the wall or tree is reached, turn round and give the trees a second dose, applied in the opposite direction. This compound dose, skilfully administered, will bring the poison in direct contact with every leaf and twig. In bad cases, too, a second dose the following day is advisable.

This is almost sure to finish any sick aphides that may be in the process of recovery, as well as to hit any that may have been missed on the first application. Then a series of heavy shower baths should succeed the poisoning processes in order to wash off the rough of the tobacco and wash down the dead flies and much of the *debris* they may have left behind them. Some prefer tobacco dust or snuff to the liquid. It requires, however, more time, and is in no respect better than the other. The best way of applying it is to wash the trees over with water, until the leaves are thoroughly wetted. Then take a dredge, like a large pepper-box, and scatter the dry snuff over the infested parts. The snuff kills the aphides, but it is a difficult and tedious process to get it into contact with them all. Quassia chip tea, a strong infusion of Gishurst Compound, will also kill aphides. But, upon the whole, there is no better nor more potent remedy than the oldest of all—tobacco liquor, diluted with three or four times its volume of water, according to its strength. Amateurs who have peach or nectariae trees in their dwelling houses, and lady cultivators who hate to handle or smell the weed in any form, may clear their trees of the fly by dissolving an ounce of smelling salts in a gallon of water, and syringing the trees with this pleasant and refreshing ammoniacal liquor.

XIV.—Brown and White Scale.

The latter seldom attacks peach trees, the former frequently, especially under glass, though it is also not uncommon in some gardens in the open air. Once established, it has unfortunately a wonderful tendency to reproduce itself. It adheres firmly to the wood and feeds on the bark, seldom, unless very abundant indeed, infesting the leaves to any extent. The best means of extirpation consist in scraping or rubbing off the scale as soon as one is seen. A small hard brush and a strong lather of soap and water are the best means to employ. If the trees, however, are much infested, they should be dressed over with train oil in winter, taking care that every portion of the wood is smeared. This is a far more simple and effective remedy than the different smears compounded chiefly of sulphur, soap, tobacco juice, clay, or cow dung, so generally recommended for smearing peach and other trees.

XV.—Caterpillars.

The different saw flies and beetles often do considerable injury to peaches and nectarines. Of these the larvæ of figure of 8 moth, the

plum tree tortrix, and the garden chafer are the most destructive, and, being of considerable size, are readily seen, and may be picked off by hand. The moment a leaf is seen to be punctured a search should be made for these caterpillars, and renewed until found, though the tomtit and the sparrow may often have been before the cultivator in clearing off these, to them, sweet morsels.

Frequently, too, a sharp eye may detect on peach trees something like a small dense spider-like web. This is produced by the grub of the peach saw fly, and should be collected and burned before they have time to spread. The larvæ should also be picked off when on the feed. A little perseverance in hand-picking will speedily clear even large peach trees of these pests.

The garden weevil is even more destructive at times than either of the foregoing. This small black beetle hides itself in the earth by day, and comes forth at night and devours buds, young leaves, fruit, or shoots—in fact, any part of the peach sufficiently soft for its somewhat hard mouth and voracious stomach. A night hunt, aided by a powerful bullseye lantern flashing suddenly on them while on the feed, and expert eyes and fingers will soon lessen their number. They may be also sought out and found by day in holes and crevices of the wall, under the bark, and behind branches, and especially in holes in the earth around the roots of trees. It is seldom that either of these insects do much harm, unless in cases where the walls are old, the soil more or less exhausted, and the cultivation somewhat neglected. However, as there are not a few exceptions, it is well to keep a sharp eye on the trees, and the moment a leaf is seen punctured, eaten, twisted, or blistered, examine it carefully for caterpillars, beetles, or larvæ.

XVI.—Snails and Slugs.

Of insects that prey on the fruit of peaches and nectarines, may be named first in order, though not in destructiveness, snails and slugs. In old gardens in damp situations these often do serious mischief. Their traces, however, may be easily seen by the slime they leave behind them, and it is an easy matter to find them when feeding on the luscious fruit at night, or, better still, hid up in some damp corner by day. A frequent dust of lime over the border, or a cordon of lime laid at the base of the wall or around the bole of the trees, will, as a rule, be a sufficient barrier to these creeping lovers of peaches.

XVII.—Earwigs.

THESE are far more difficult to extirpate, and it is impossible to bar them out from the fruit. They will pass over or through anything to get at a peach or nectarine, and make short work of devouring it when there. Fortunately, after a feast they desire to rest, and they infinitely prefer to sleep near the feast. The skilful cultivator takes advantage of this luxurious habit, and provides comfortable sleeping accommodation in the form of 6in. lengths of bean stalks, reed, or cane, pushed under the branches. The earwigs slip into these at dawn of day, and shortly afterwards the cultivator, with a deep jug about half full of water, hot or cold, pulls out his traps, holds one end over the water, and applying the other to his mouth, consigns the earwigs to a watery grave. Each trap is thus emptied and replaced day by day until the whole of the pests disappear. It is well also to begin this sure means of destroying the earwigs before the fruit is ripe, and thus many of the finest peaches are saved from destruction.

XVIII.—Ants.

THESE are most destructive where they abound. Some cultivators encourage ants on their fruit trees. They cherish the belief that they kill and eat the aphides. Not they. The ants are far too wise to kill the goose that lays for them such golden eggs. By the aphides the ants live. They milk them dry of sweet juice daily or oftener; and, lest the advantage should be all on one side, the ants remove the aphides to fresh feeding quarters and pastures new and sweet as often as necessary for the delectation of the aphides and the profit of the ant. All this, however, is totally antagonistic to the interests of cultivators. The ants are sheer gluttons among rich fruit. Luscious peaches, nectarines, apricots melt into nothingness under their onslaughts as snow beneath the glaring heat of summer suns. They will scoop out all the flesh and sweet juices of the finest peach in a few hours. The best cure for ants is arsenic and boiling water. Honey or sugar and arsenic entice the ants to their destruction. Sweet oil will also kill them, but it is hopeless to set oil traps against the attractions of ripe fruit. Boiling water in their nests is also a certain cure. They may be also watered out with cold water. Sewage and manure water made with guano are distasteful

to ants. They should be destroyed or driven away before the wall fruit are ripe, as few things are more unpleasant than to have one's finest fruit disfigured or destroyed by these insects.

XIX.—Woodlice, Blackbeetles, and Ladybirds.

Woodlice will also eat peaches, but, unless in rough walls or very old gardens, they are seldom found in such numbers as to do serious injury. The reed trap is useful for them also, and, better still, cold potato, placed in small pots, filled nearly full of moss, and laid along the base of the wall. These should be examined every morning and the woodlice drowned. Blackbeetles and cockroaches also eat peaches and nectarines. They may be trapped by similar methods, and also caught on the feed at night, though it needs sharp eyes and hands to catch the latter. Ladybirds seldom come in sufficient quantities to do much harm. Occasionally, however, they beset us in swarms or clouds, almost like locusts ; and on such occasions they devour ripe peaches and pears in a wholesale way that is quite alarming. They are, however, easily destroyed by hand-picking, as they seem to become stupid, sluggish, or intoxicated, as they gorge themselves with fruit.

XX.—Bluebottle Flies, Bees, Wasps, Butterflies, Hornets.

It is best to class all these together, as they are all destroyed by similar means, that is, by various decoys or traps. There is nothing so attractive to all these as a mixture of beer and sugar. The vinous smell of these attracts them more strongly than the aroma of the richest peach or nectarine. The best bottle is a clear glass one, made on purpose, with a large hole in its wide top, the glass sloping down to it, and a hole in one side of the top, which is corked up, unless when used for emptying. No sooner does a wasp or fly light on the inclined plane than in it goes, and not one in a thousand ever gets out again. The quantity of fruit-eating winged things caught with such bottles is simply astounding. Each holds about a pint and a half, and they should be emptied daily where these destructive insects abound. A peck of dead insects a morning from two dozen bottles is nothing extraordinary. Bluebottles generally preponderate, then wasps, next butterflies, hornets, moths, &c. It is difficult to determine at times which are most destructive to the fruit. The order

of proceeding is generally as follows: A wasp or a hornet lights on a peach, breaks its rind, finds it hardly to its high and delicate taste, dashes at another, and yet another. The bluebottles, butterflies, and at times the bee, follow these pioneers, settle down on the fruit, and remain to devour them, so that upon the whole it may be taken for granted that the bottles seldom destroy any insects that are not bent on destroying the fruit. It is very vexing at times to find so many honey bees in the bottle traps, but these have at times a mania for peaches, and must take the consequences. In certain states of the atmosphere common flies also attack the fruit. Ladybirds in quantities also not seldom find their way into the bottle traps, proving that they also have a sweet tooth. Of course, too, every wasp's and hornet's nest should be destroyed as soon as found, and before the fruit is ripe, for once they taste the latter a good many of them are so fascinated or intoxicated that they seldom or never go home afterwards. There are few more simple methods of destroying the nests of either than by thrusting a loose hayband into the entrance of the nest and thoroughly saturating it with coal tar. This forms an impassable barrier.

XXI.—Squirrels, Mice and Rats.

THE best way of checking these destructive pests is by trapping. Many also place a piece of zinc or tin round the boles of the trees, projecting 4in. or so all round, slightly bent down and with serrated edges. This baffles either mice or rats to get over, and neither of them can very well climb a vertical wall. But these destructive rodents should be kept down or extirpated. Squirrels are more difficult to manage. They are exceedingly fond of fruit, when they once get a taste of it, and are not content to eat their dessert on the spot, but proceed to store it; peaches are rather too heavy of carriage, but the smaller nectarines and plums they can carry away easily and rapidly. Trapping or shooting is the only means of getting rid of squirrels that have acquired a taste for such delicacies.

XXII.—Birds, Fowls, etc.

PHEASANTS, especially tame birds, are very fond of peaches, as are also partridges. The writer has frequently found them at work; pheasants are by far the worst, and will knock the fruit off the wall, or will speedily

peck those they find down. Shoot, trap, and pot the peach-eating vermin, or sue the game preservers for compensation. Peaches are often worth a shilling apiece, and the cultivator cannot afford to lose them. Fowls are as bad or worse than pheasants. They will, after once tasting peaches, run round the garden as soon as out to see what they can find and eat all they find. They must be kept away from them. Birds, especially blackbirds and thrushes, in dry weather, get frenzied among ripe peaches. They must be shot or trapped or netted out at once.

XXIII.—Dogs.

Pet dogs also get fond of peaches and nectarines. This will be new to many, but it is nevertheless true. The writer has known at least four pet dogs that ate fruit greedily. His present brown mongrel spaniel, not only eats peaches, nectarines, apricots, plums, grapes, pears, but goes and helps herself to gooseberries off the bushes, and is as careful to select the sweetest as to avoid the thorns pricking her nose. She also helps herself to an occasional plum off cordon trees, and works the walls at times during the autumn to look for a fallen peach, nectarine, or apricot, tossing them about and barking, to clear them of wasps and flies, before eating them. Another dog, a small white Russian terrier, would help himself to a peach off the wall. Of course the generality of dogs do not eat peaches. But the above facts seemed sufficiently interesting to deserve notice, and they may also prove useful to some readers who find their fruit gnawed or mauled in a peculiar manner. To such it may be worth while to give the advice to watch their pet dogs.

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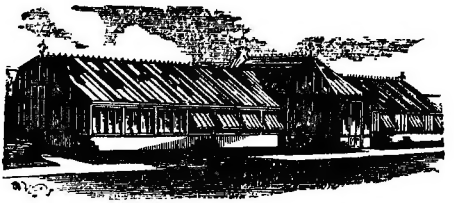

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